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Nellis Air Force Base, Nevada photovoltaic project

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NAVAL POSTGRADUATE SCHOOL

MONTEREY, CALIFORNIA

MBA PROFESSIONAL REPORT

Nellis Air Force Base, Nevada Photovoltaic Project

**By: Curtis D. Henley
Darius A. Phillips
December 2007**

**Shaun C. Hunt
June 2008**

**Advisors: Brad R. Naegle and
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NELLIS AIR FORCE BASE, NEVADA PHOTOVOLTAIC PROJECT

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Submitted in partial fulfillment of the requirements for the degree of

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from the

**NAVAL POSTGRADUATE SCHOOL
December 2007**

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NELLIS AIR FORCE BASE, NEVADA PHOTOVOLTAIC PROJECT

ABSTRACT

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LIST OF ACRONYMS

AC – Alternating Current
ACC – Air Combat Command
ACORE – American Council on Renewable Energy
ADR – American Depositary Receipt
AFCEA – Armed Forces Communications & Electronics Association
AFB – Air Force Base
AFRPA – Air Force Real Property Agency
BBP – Bullet Background Paper
BDR – Bill Draft Request
BP – British Petroleum
CE – Civil Engineering
CEO – Chief Executive Officer
CES – Civil Engineering Squadron
CJCS – Chairman, Joint Chiefs of Staff
CO – Contracting Officer
CONS – Contracting Squadron
CORP – Corporation
DC – Direct Current
DoD – Department of Defense
DOE – Department of Energy
EA – Environmental Assessment
EBS – Environmental Baseline Survey
EPA – Environmental Protection Agency
EPRI – Electric Power Research Institute
ESPC – Energy Savings Performance Contract
EUL – Enhanced Use Lease
FAR – Federal Acquisition Regulation
HUBZone – Historically Underutilized Business Zone

ID – Identification
IFB – Invitation for Bid
INC – Incorporated
JCS – Joint Chiefs of Staff
KW – Kilowatt
KWH – Kilowatt Hour
LLC – Limited Liability Corporation
LPTA – Lowest Priced Technically Acceptable
LTD – Limited
MILCON – Military Construction
MW – Megawatt
NASDAQ – National Association of Securities Dealers Automated Quotations
NEC – National Electric Code
NPC – Nevada Power Company
NRS – Nevada Revised Statutes
NTTR – Nevada Test and Training Range
OMB – Office of Management and Budgets
POC – Point of Contact
PUC – Public Utility Commission
PUCN – Public Utility Commission of Nevada
PV – Photovoltaic
Q&A – Questions and Answers
RE – Renewable Energy
REC – Renewable Energy Credit
SAF – Office of Secretary of the Air Force
SECAF – Secretary of the Air Force
SECDEF – Secretary of Defense
SOW – Statement of Work
SPWR – SunPower
UESC – Utility Energy Services Contracts

USA – United States Army

USAF – United States Air Force

USMC – United States Marine Corps

USN – United States Navy

VTC – Video Telephone Conference

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I. INTRODUCTION

This paper analyzes the feasibility for production of renewable energy on Department of Defense (DoD) installations with specific focus on renewable energy initiatives undertaken at Nellis Air Force Base (AFB) located near Las Vegas, Nevada. Currently, Nellis AFB is on track to be the leading producer of renewable energy within the DoD. The main research question is: What are the necessary criteria and preconditions for consideration of renewable energy production on DoD installations and how does the Government establish contracts with local power generating companies? Specifically, this paper analyzes the Nellis AFB initiative as a model because of its commitment in meeting DoD Renewable Energy goals while saving taxpayer dollars and demonstrating the feasibility of producing energy without fossil fuels.

This paper analyzes strengths and weaknesses of the renewable energy requirements generation and contracting processes used by Nellis AFB. Additionally, recommendations are provided as to whether or not the analyzed processes used for the Nellis AFB initiative can be utilized, in part or in whole, at other bases.

Beginning in July 2006, Nellis AFB teamed with SunPower Corporation to begin building the largest solar plant in North America.¹ Since this renewable energy project is archetype, examination and analysis may show how such an energy project could prove to be both economically and environmentally beneficial for potential use at other bases. For instance, currently, the Energy Information Administration estimates, in its Annual Energy Outlook 2007 through 2030, that the demand for electricity will grow by 39 percent in the residential sector, by 63 percent in the commercial sector, and by 17 percent in the industrial sector. Additionally, population growth and disposable income is expected to increase demand for products, services, and floor space, with a corresponding

¹ SunPower Corporation Case Study. (2007). Nellis Air Force Base Builds Largest Solar Plant in North America with SunPower. Retrieved November 12, 2007, from the World Wide Web: http://www.sunpowercorp.com/For-Power-Plants/~media/Downloads/for_powerplants/SPWRNellis_CS.ashx.

increase in demand for electricity for space heating and cooling.² Therefore, the need for renewable energy projects, like SunPower Corporation's Nellis AFB PV solar project, will increase as the demand for energy.

Chapter II of this paper provides a background of (1) renewable energy, (2) the current Presidential Administration's renewable energy position, (3) the Joint Chief of Staff's military position on renewable energy, (4) Nellis AFB, (5) the Air Force's Air Combat Command (ACC) ACC/A7 Mission Support's Energy Department, (6) key subordinate offices' (99th Civil Engineering Squadron and 99th Contracting Squadron), and (7) the prime contractor SunPower's involvement in this process.

Chapter III provides historical data and documentation, including the data to be analyzed from Nellis AFB's renewable energy requirements generation and contracting processes. These processes are examined based on state and Federal requirements needed for advancing this renewable energy project. Chapter III data specifically presents Air Combat Command's (ACC/A7) interest in solar energy, Nellis AFB Civil Engineering role in working on this solar energy project, contracting procedures needed to support the solar energy project, and the contractor responsible for building this project. Chapter IV is an analysis of the data collected on the Air Force efforts to produce and distribute cost-effective renewable energy. Chapter V examines the strengths and weaknesses of renewable energy projects based on Nellis AFB's accomplishments, while offering conclusions and recommendations for other DoD installations considering complex renewable energy projects.

A. HOW DO THE AUTHORS GO ABOUT THE RESEARCH?

Understanding renewable energy at Nellis AFB required assistance from numerous resources. The first step in the research process was to understand renewable energy concepts and definitions and its application to Federal energy mandates. This research began with internet searches and then shifted to personal and professional contacts that had experience dealing in certain areas of renewable energy, specifically

² Energy Information Administration. (February 2007). *EIA Annual Energy Outlook 2007 with projections to 2030*. Retrieved October 18, 2007, from the World Wide Web: <http://www.eia.doe.gov/oiaf/aeo/electricity.html>.

photovoltaic production. After acquiring data on the photovoltaic power process, a correlation was made with Nellis AFB's Solar Power System. Since this type of power system was located on a military installation and labeled the largest solar photovoltaic power plant in the United States, it became the main focus area of our research.³ In order to understand how the Government implemented this process and determine the contracting mechanisms responsible for the development of the solar energy power plant, the project team traveled to the Solar Power plant located at Nellis AFB to obtain needed data and conduct interviews with the 99th Contracting Squadron, 99th Civil Engineering Squadron, representatives from SunPower Corporation, and the ACC-A7.

³ SunPower Corporation Case Study. (2007).

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II. BACKGROUND

A. RENEWABLE ENERGY AND LEADERSHIP PERSPECTIVES

Renewable energy is energy generated from resources that are theoretically unlimited, rapidly replenished or naturally renewable such as wind, water, sun, wave and refuse, and not from the combustion of fossil fuels.⁴ According to Andy Karsner, Assistant Energy Secretary for Energy Efficiency and Renewable Energy, the nation's energy policy has three important elements: economic competitiveness, environmental concerns, and national security. When considering energy policy, these three elements need to be considered.⁵



Figure 1. Wind Turbines on the side of a Desert Hill. Photo taken on October 16, 2007 by Shaun Hunt between Tehachapi, CA and Mojave, CA

“Environmental concerns, reducing pollutants and greenhouse gas emissions are especially important priorities. And the potential for efficiency to limit our future generation needs could yield both environmental and economic dividends. The recent

⁴ Wychavon District Council.(2007). Retrieved October 27, 2007, from the World Wide Web: <http://wychavon.whub.org.uk/home/wdc-planning-gen-jargon>.

⁵ White House. (2007). Picture retrieved October 27, 2007, from World Wide Web: <http://www.whitehouse.gov/ask/20070327.html>.

unprecedented growth in wind and solar technologies allows us to project substantial displacement of carbon emissions at utility scale and lower the carbon footprint of the build environment which accounts for approximately 40 percent of all emissions. Solar and wind energy are both clean and emissions-free sources of power, but so is nuclear power. As I've said before, there is no silver bullet. No single source of energy is the key to reducing our dependence on oil. With electricity demand projected to increase by nearly 50 percent over the next 25 years, we need to be both strategic and sensible about durable policies that enable market to meet demand," says Assistant Secretary Karsner.⁶



Figure 2. Photo of Assistant Energy Secretary Andy Karsner
<http://www.whitehouse.gov/ask/20070327.html>

Chairman of the Joint Chiefs of Staff, Navy Admiral Michael G. Mullen identified pressing questions the United States faces as it attempts to counter emerging threats while maintaining a position of leadership. For example, “how will global industrialization, world population expansion, and migration affect the consumption rates, the distribution, and the long-term availability of vital resources such as water and energy?” Further, “how will competition for those resources affect global stability, and

⁶ White House. (2007). Picture retrieved October 27, 2007, from World Wide Web:
<http://www.whitehouse.gov/ask/20070327.html>.

what role will the military play in managing these risks? How can we do all that is required of us and still remain good stewards of our nation's resources?"⁷



Figure 3. Photo of Admiral Michael G. Mullen

The following will provide a background of Air Combat Command, Nellis Air Force Base, Nevada, key Nellis AFB organizations to include 99 Civil Engineering Squadron and 99 Contracting Squadron, and the contractor SunPower Corporation.

B. NELLIS AFB AIR FORCE BASE, NEVADA

Nellis AFB Air Force Base, Nevada is called the “Home of the Fighter Pilot,” and for good reason. Nellis AFB is a member of the United States Air Force’s Air Combat Command and home of the U.S. Air Force Warfare Center. With five wings and more than 150 aircraft, the Warfare Center is responsible for advanced combat training, tactics development, and operational testing.⁸

⁷ Department of Defense (DoD). (2007). New Chairman lays Out Top Priorities. Retrieved October 27, 2007, from the World Wide Web: http://www.defenselink.mil/home/features/2007/1026_mullens/index.html.

⁸ Nellis AFB. (2007). Retrieved October 27, 2007, from the World Wide Web: <http://www.nellis.af.mil/>.



Figure 4. Welcome Sign at Nellis Air Force Base Entrance. Photo taken on October 18, 2007 by Shaun Hunt at entrance to Nellis AFB

The Warfare Center is the largest and most demanding advanced air combat training mission in the world. Nellis AFB provides training for composite strike forces which include every type of aircraft in the Air Force inventory. Training is conducted in conjunction with air and ground units of the Army, Navy, Marine Corps, and air forces from U.S. allied nations. The crews do not come to learn how to fly but instead how to be the best combat aviators in the world.⁹

1. Air Combat Command

Air Combat Command is the primary force provider of combat airpower to America's warfighting commands. To support global implementation of national security strategy, ACC operates fighter, bomber, reconnaissance, battle-management, and electronic-combat aircraft. It also provides command, control, communications, and intelligence systems, and conducts global information operations. As a force provider, ACC organizes, trains, equips, and maintains combat-ready forces for rapid deployment

⁹ Nellis AFB. (2007). Retrieved October 27, 2007, from the World Wide Web: <http://www.nellis.af.mil/main/welcome.asp>.

and employment while ensuring strategic air defense forces are ready to meet the challenges of peacetime air sovereignty and wartime air defense. ACC numbered air forces provide the air component to U.S. Central and Southern Commands with Headquarters ACC serving as the air component to U.S. Northern and Joint Forces Commands. ACC also augments forces to U.S. European, Pacific, and Strategic Commands.¹⁰



Figure 5. Military Fighter Planes Flying Over Langley Air Force Base. Air Force Link, <http://www.af.mil/photos/index.asp?galleryID=40&page=6>

2. 99 Civil Engineering Squadron (CES)

The 99th CES designs and constructs new facilities and maintains and repairs existing facilities and utility systems. It also provides fire protection, crash rescue, environmental protection, sanitation services, as well as dormitory, furnishings, and

¹⁰ Nellis AFB. (2007). Retrieved October 27, 2007, from the World Wide Web: <http://www.nellis.af.mil/main/welcome.asp>.

family housing management. Members of the 99th CES also provide major accident and natural disaster response and recovery operations.¹¹

The squadron's readiness flight develops and exercises base disaster preparedness programs and provides initial and refresher chemical warfare defense training. The 99th CES manages the bases and Nevada Test and Training Range's environmental programs and explosive ordinance disposal activities.¹²

The heritage, lineage, and honors of the 99th Civil Engineer Squadron began on Tuesday, May 29, 1941 when Headquarters, Army Air Force (HQ AAF) constituted a Bombing and Gunnery Range Detachment. HQ AAF activated this detachment on Tuesday, July 1, 1941.¹³

This detachment "set foot on the soil of Wendover Field, Utah" with the personnel of the 5th Air Base Group on Tuesday, August 12, 1941 under the command of Captain Darold G. Smith. The primary responsibilities of the two officers and ten enlisted men consisted of construction, maintenance, and operation of precision bombing ranges for bomber aircrews from Geiger Field, Washington; Gowan Field, Idaho; Pendleton Field, Oregon; and Salt Lake City Air Force Base, Utah.¹⁴

The detachment, which soon grew to five officers and 101 enlisted men, became the 5th Army Air Forces Bombing and Gunnery Squadron on Monday, December 7, 1942. Throughout 1943 and until their day of disbandment on Saturday, April 1, 1944, the Fifth continued range construction and maintenance of Wendover Field, Utah. Thirty-five years, ten months, and twenty-six days later, Headquarters Tactical Air Command called for the reconstitution of the Fifth and its redesignation to the 554th Civil

¹¹ Nellis AFB. (2007). Retrieved October 27, 2007, from the World Wide Web: <http://www.nellis.af.mil/main/welcome.asp>.

¹² Ibid.

¹³ "A Brief History of the 99th Civil Engineering Squadron" Snead Jenny, personal e-mail, November 5, 2007

¹⁴ Ibid.

Engineering Operations Squadron (CEOS) and the 554th Civil Engineering Support Squadron (CESS) on Tuesday, February 26, 1980.¹⁵

The 554th CESS and 554th CEOS activated at Nellis AFB on March 1, 1980 with an operating location at Indian Springs Air Force Auxiliary Field. The activation supported the Tactical Fighter Weapons Center effort to enhance the effectiveness of the civil engineering operations at Nellis AFB, Indian Springs, and the Nellis AFB Range support system in response to an increasingly complex and rapidly expanding mission. The 554th CESS and 554th CEOS were inactivated on November 1, 1991 and their functions combined that same day into a new unit designated the 558th Civil Engineering Squadron (CES). Members of the 558th CES served in Operations Desert Shield and Desert Storm during the Persian Gulf Conflict. On October 1, 1995, the 99th Air Base Wing was reactivated at Nellis AFB and on that same day, the 558th CES was redesignated as the 99th Civil Engineer Squadron.¹⁶

¹⁵“A Brief History of the 99th Civil Engineering Squadron” Snead Jenny, personal e-mail, November 5, 2007

¹⁶ Ibid.



Figure 6. Nellis AFB Civil Engineering Squadron Building. Photo taken October 17, 2007 by enlisted member of 99 Civil Engineer Squadron. Left to right: Shaun Hunt, Darius “Andre” Phillips, and Curtis Henley

3. 99 Contracting Squadron (CONS)

The 99th Contracting Squadron’s vision is to be rapid, agile, responsive, and far-reaching. The mission is to provide timely, effective, and efficient life-cycle contract support to meet the needs of installation commanders, deployed commanders and resident, tenant, and supported units and train and equip contingency contracting officers for worldwide deployment.¹⁷

The organization is composed of the Infrastructure Flight, Base Operations and Support Flight, Specialized Flight, and Plans and Programs Flight. The Infrastructure Flight supports construction requirements. The Base Operations and Support Flight

¹⁷ 99 CONS Squadron Brief. Salton George, personal e-mail, October 29, 2007.

supports other than construction and specialized requirements. The Specialized Flight supports requirements normally not found at operational level such as Battlelab, CAOC, Predator, F/A 22 operations support, and A-76 efforts.¹⁸

The staffing of the squadron is nine officers, 17 enlisted and 29 civilians for a total of 55 personnel. The squadron is authorized 4 officers, 22 enlisted and 34 civilians for a total of 60 personnel.¹⁹

The squadron supports a number of units. These units include the USAF Warfare Center, the 53rd Wing, the 57th Wing, the 98th Range Wing, the 99th Air Base Wing, the 432nd Wing, 23 Tenant Units, and the Nevada Test and Training Range.²⁰

The squadron had detailed FY 2006 business activity. Contract obligations were \$120 million with 2,000 contract actions. The total small business obligations were \$76.7 million with \$38.4 million going to small disadvantaged businesses, \$20 million going to women-owned businesses, \$12.3 million going to HUBZone businesses, and \$4.1 million going to disabled veteran-owned businesses. Government Purchase Card (GPC) purchases amounted \$28 million. This was comprised of 652 cardholders with 50,000 actions. There was more than \$480 million of contracts managed and 97.7% competitive awards.²¹

The squadron regularly deals with a number of pressing issues. These include fiscal year-end closeout, Creech AFB build-up, personnel, NSPS, contract oversight, training, inefficiency drivers, and 57 MXG (A-76).²²

¹⁸ 99 CONS Squadron Brief. Salton George, personal e-mail, October 29, 2007.

¹⁹ Ibid.

²⁰ Ibid.

²¹ Ibid.

²² Ibid.

Squadron notables are Distinguished Service Award, Nevada Veteran-Owned SB Champion, Air Force Civilian Award, Exemplary Service Awards, Professional Provider of the Year, North America's largest solar farm, Predator Operations Center, and JUAS Center of Excellence.²³

An overall summary about the squadron is that it is the caretaker of the "crown jewel," it is a large operational contracting squadron; it has a diverse and complex support function, and asserts it has outstanding people doing outstanding things.²⁴

4. SunPower Corporation

SunPower is a company that designs, manufacturers, and delivers the highest efficiency solar electricity technology worldwide. Based on more than 20 years of innovation, SunPower delivers proven solar performance to residential, commercial, and utility-scale power plant and customers.²⁵

SunPower's high-efficiency solar cells, panels, and systems deliver significantly more energy per unit area than competing systems. SunPower asserts that its customers benefit from lower electric bills, meaningful financial returns, and maximum carbon emissions savings.²⁶

SunPower envisions a future where solar power is an essential component of the global energy mix. SunPower endeavors to continuously set new standards for solar performance, value, appearance, and its customers' experience. SunPower believes it will compete with retail electric rates by reducing system cost by 50% by 2012.²⁷

SunPower solar technology was developed by Dr. Richard Swanson and his students while he was professor of electrical engineering at Stanford University. Financial support for Dr. Swanson's early research was provided in part by the U.S.

²³ 99 CONS Squadron Brief. Salton George, personal e-mail, October 29, 2007.

²⁴ Ibid.

²⁵ SunPower Corporation. (2007). Retrieved November 2, 2007, from the World Wide Web: <http://www.sunpowercorp.com/About-Us.aspx>.

²⁶ Ibid.

²⁷ Ibid.

Department of Energy and the Electric Power Research Institute (EPRI). In 1985, Dr. Swanson founded SunPower Corporation to commercialize high-efficiency photovoltaic cell technology for use in solar concentrators.²⁸

In January 2007, SunPower acquired PowerLight Corporation, a leading global provider of large-scale solar power systems. PowerLight has designed, deployed and operates hundreds of large-scale solar systems around the world with a total capacity of more than 150 megawatts and growing.²⁹

By integrating processes and technologies across the value chain, SunPower plans to reduce the installed cost of a PV solar system. SunPower believes solar systems will produce power that can compete with retail electric rates and become a mainstream energy resource.³⁰

SunPower's NASDAQ symbol is SPWR. Its headquarters is in San Jose, California and has offices in North America, Europe, and Asia. SunPower is a majority-owned subsidiary of Cypress Semiconductor Corporation, whose New York Stock Exchange symbol is CY.³¹

A major SunPower product is its trackers. SunPower Trackers are patented single-axis tracking systems for large-scale solar electric projects and power plants. Uniquely designed to rotate on a single axis, SunPower Trackers follow the sun throughout the day and deliver up to 30% more energy than traditional fixed-tilt ground systems. The trackers' low cost, innovative, and proven design requires fewer moving parts, resulting in less maintenance and faster deployment than conventional tracking systems.

²⁸ SunPower Corporation. (2007). Retrieved November 2, 2007, from the World Wide Web: <http://www.sunpowercorp.com/About-Us.aspx>.

²⁹ Ibid.

³⁰ Ibid.

³¹ Ibid.

5. Solar Energy Concept

Energy radiating directly from the sun has always been available to us. Since the development of the first solar cell in 1954, its usage has continued to grow steadily along with its efficiency. Using a calculator that operates without a battery is an example of solar energy at work. Solar calculators use solar cells to harness light from the sun. In this same way, people can use solar energy on a larger scale, to power their homes and businesses.³²

Solar cells are able to convert sunlight into electricity. These photovoltaic (PV) cells are made up of special materials, particularly the element silicon, which allows them to absorb light. Silicon is known as a semiconductor due to its absorptive and insulative properties.³³

In solar cells, silicon is placed under non-reflective glass to collect photons (units of electromagnetic energy) from the sun. The PV cells have one or more electric fields that essentially force the electrons harnessed by the absorption of sunlight to move in a certain direction. This movement of electrons, called a current, is further guided by metal contacts on the PV cell.³⁴

Individual solar cells are packaged into solar panels that can be mounted on a structure roof or on the ground to take advantage of the free solar energy radiated there every day. PV systems can either be standalone or grid connected. In a grid-connected system, the PV cells produce power in parallel with the electrical utility (i.e., the local power company), which uses a utility grid to connect and distribute power to its users.³⁵

6. How Solar Works in a Home or Business

After installation, solar panels absorb the sun's rays, even on cloudy days, and convert sunlight into usable electrical energy. Next, an inverter converts the DC current

³² SunPower Corporation. (2007). Retrieved November 2, 2007, from the World Wide Web: <http://www.sunpowercorp.com/Smarter-Solar/How-Solar-Works.aspx>.

³³ Ibid.

³⁴ Ibid.

³⁵ Ibid.

from the solar panels to AC current for use throughout a home. The home's solar system is connected to the utility grid through a standard utility meter that tracks the home's net power use while taking into account the electricity production from the home's solar system.³⁶

During sunny days the home's solar system generates more power than the home needs, the home's electric meter actually reverses direction and spins backwards as the home lends that energy to the utility grid. When the sun goes down, the home effectively retrieves that energy when it needs it. This process is called net metering.³⁷

When one considers that enough sunlight falls on the earth's surface each minute to meet the world's energy demands for an entire year, it is clear that sunlight represents a great alternative energy opportunity. Today, solar power is considered the most abundant, reliable, clean source of all known energy sources, and the world has only just begun to tap its potential.³⁸

Generating solar energy can potentially help meet the new Federally-mandated energy conservation initiatives passed by the House of Representatives. Finding the correct answers to each of these sections could help DoD meet electricity requirements, lead to a significant cost savings and reduce future carbon dioxide (CO₂) emissions.

7. Federally-Mandated Energy Initiatives

The new energy bill is mandating 15% of all energy production from utilities be sourced from renewable sources.³⁹ The executive order 13423 on the most recent energy bill requires renewable plants to be built on Federal activities.⁴⁰ Public Law 109-58, dated August 8, 2005 and titled "Energy Policy Act of 2005" states in section 1833; "Renewable Energy on Federal Land" (a) National Academy of Sciences Study- not later

³⁶ SunPower Corporation. (2007). Retrieved November 2, 2007, from the World Wide Web: <http://www.sunpowercorp.com/About-Us.aspx>.

³⁷ Ibid.

³⁸ Ibid.

³⁹ H.R. 3221 and Ron Tudor, J.D., personal e-mail, August 23, 2007.

⁴⁰ Ibid.

than 90 days after the date of enactment of this Act, the Secretary of the Interior shall enter into a contract with the National Academy of Sciences under which the National Academy of Sciences shall (1) study the potential of developing wind, solar, and ocean energy resources (including tidal, wave, and thermal energy) on Federal land available for those uses under current law and the outer Continental shelf; (2) assess any Federal law (including regulations) relating to the development of those resources that is in existence on the date of enactment of this Act; and (3) recommend statutory and regulatory mechanisms for developing those resources. (b) Submission to Congress- not later than 2 years after the date of enactment of this Act, the Secretary of the Interior shall submit to Congress the results of the study under subsection (a). Section 211 states the sense of Congress regarding generation capacity of electricity from renewable energy resources on public lands; it is the sense of the Congress that the Secretary of the Interior should, before the end of the 10 year period beginning on the date of enactment of this Act, seek to have approved non-hydropower renewable energy products located on the public lands with a generation capacity of at least 10,000 megawatts of electricity.⁴¹

The Renewable Energy Working Group's Assessment discussed that the FY 2002 MILCON Appropriations Act provided \$6 million to DoD to perform a renewable energy assessment. The access is wind, geothermal, and solar, and uses the services of several Department of Energy (DOE) laboratories such as the Pacific Northwest National Laboratory in Oregon, the National Renewable Energy Laboratory in Colorado, and the SANDIA National Laboratory in New Mexico. The major planned assessment results provided a detailed assessment of military installation potential for renewable energy use, including selectively placing wind anemometers, developing renewable energy project documents, and cost/benefit and risk assessments of potential projects. There would be identification of renewable energy potential near bases and recommendations to mitigate

⁴¹ Public Law 109-58, Energy Policy Act of 2005, August 8, 2005
http://frwebgate.access.gpo.gov/cgi-bin/getdoc.cgi?dbname=109_cong_public_laws&docid=f:publ058.109.pdf.

legal or regulatory impediments. Other goals were to improve grid reliability, expand industry capacity, and create a roadmap to facilitate future renewable purchases.⁴²

8. Military Renewable Energy Preparation

The Army Corp of Engineers completed a report in September 2005 titled “Energy Trends and Their Implications for U.S. Army Installations.” When viewed in conjunction with other DoD reports, it is evident that the military is preparing its U.S. installations for blackouts by surrounding itself with renewable energy infrastructure, both on and off installation. From the DoD Renewable Energy Assessment Final Report published in March of 2005, the DoD will encourage installations to evaluate renewable energy alternatives as part of contingency planning for grid outages. Planning should be done regionally, include regional utilities and suppliers, and consider the use of the installation’s renewable energy capacity as part of a local islanding strategy.⁴³

⁴² Renewable Energy Working Group, DoD Renewable Energy Assessment. Retrieved on August 25, 2007, from: http://www1.eere.energy.gov/femp/pdfs/rewg_snook_dodrenew.pdf.

⁴³ M. Kane, (March 30, 2006). *Military Prepares for Peak Oil*. Retrieved August 8, 2007, from the World Wide Web: http://www.fromthewilderness.com/free/ww3/033006_military_prepares.shtml.

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III. PRESENTATION OF DATA

A. INTRODUCTION

This chapter catalogues the historical data and documents key player interviews for the Nellis AFB's solar power requirements generation and contracting process. The key players are considered de-facto process experts, as they are the first ones to actually complete this sort of power purchase agreement that includes the lease of Federal land. Documenting their efforts throughout the entire process allowed the researchers to analyze the efforts, and provide recommendations to streamline similar power projects in the future.

B. INTRODUCTION OF RESEARCH PARTICIPANTS

The research participants are:

- Mr. Steve Dumont, C.E.M. at Headquarters Air Combat Command (ACC)/Mission Support (A7). Steve.dumont@langley.af.mil, (757) 764-2569.
- Mr. George E. Salton, Director of Business Operations, 99th Contracting Squadron (CONS). George.salton@Nellis AFB.af.mil, (702) 652-4003.
- Ms. Michelle Price, Base Energy Manager, 99th Civil Engineering Squadron (CES). Michelle.price@Nellis AFB.af.mil, (702) 652-7793.
- Captain Wesley Glisson, 99th CES/CEOE (OIC), Wesley.glisson@Nellis AFB.af.mil, (702) 652-3049.
- Mr. Mark Harris, Resource Planning Engineer, Public Utility Commission of Nevada (PUCN). mpharris@puc.state.nv.us, (775) 684-6165 / cell (775) 772-7035.
- Mr. Richard D. Hanson, Sr. Project Manager, SunPower Corp, Systems. rhanson@sunpowercorp.com, (510) 868-1245.

C. PRESENTATION OF DATA

This section provides a synopsis of source documents used for research. Most of the documents may be found in their entirety in the appendices.

In addition to the documentation identified in this section, the participant's responses to questions from interviews have been transcribed. The questions and

responses may contain some paraphrasing to provide for brevity, readability, and added clarity. Ms. Michelle Price, Capt. Wesley Glisson, Mr. George Salton, and Mr. Richard Hanson were interviewed in person, and email responses to request for interview clarification may also be included. The other participants, Mr. Steve Dumont, Mr. A. Grant, and Mr. Mark Harris provided information telephonically and by email.

1. Executive Order 13423, 26 January 2007⁴⁴ - Appendix A

By order of the President, all Federal agencies are to strengthen their environmental, energy, and transportation management.⁴⁵ This order covers the policy of the United States for Federal agencies to conduct their environmental, transportation, and energy-related activities under the law in support of their respective missions in an environmentally, economically and fiscally sound, integrated, continuously improving, efficient, and sustainable manner.⁴⁶

2. DoD Renewable Energy Act, 14 March 2005⁴⁷ - Appendix B

This report to Congress provides DoD's short- and long-term strategy to increase DoD's use of RE.⁴⁸ DoD evaluated renewable resources, developed purchasing strategies, evaluated the impact of RE on energy security, and prepared a future roadmap.⁴⁹ While DoD's current level of RE use meets DoE's Federal goal, it is a small fraction of the total possibilities.⁵⁰

⁴⁴ See Appendix A. Executive Order 13423. (January 26, 2007) *Strengthening Federal Environmental, Energy, and Transportation Management*. Retrieved October 28, 2007, from: <http://a257.g.akamaitech.net/7/257/2422/01jan20071800/edocket.access.gpo.gov/2007/pdf/07-374.pdf>.

⁴⁵ Ibid.

⁴⁶ Ibid.

⁴⁷ See Appendix B. Department of Defense (DoD). (2007). *New Chairman lays Out Top Priorities*. Retrieved October 27, 2007, from the World Wide Web: http://www.defenselink.mil/home/features/2007/1026_mullens/index.html.

⁴⁸ Office of the Under Secretary of Defense for Acquisition, Technology and Logistics. (March 14, 2005). *DoD Renewable Energy Assessment Report to Congress*. Retrieved July 27, 2007, from the World Wide Web: http://www.acq.osd.mil/ie/irm/irm_library/Final%20Renewable%20Assessment%20Report.pdf, p. 2.

⁴⁹ Ibid., 2.

⁵⁰ Ibid., 7.

3. AF Land Lease⁵¹ - Appendix C

All Government property used by the Air Force is managed at Air Staff. Leasing of any land requires an approval signature from either the SECAF or their duly authorized representative, such as Mr. Fred Kuhn, the Deputy Assistant Secretary of the Air Force, for installations. This is a 20-year lease of 140 acres of land at Nellis AFB for the grand sum of \$10 for the entire term to be used to produce PV solar energy and sell it to the base.

4. 99 CONS

a. Solicitation, Offer and Award⁵² - Appendix D

The draft solicitation, offer and award are the document the 99th CONS sent out as the RFP. It contains information on the proposed project solicitation, description of services with estimated price, statement of work, performance parameters, contract clauses, list of attachments, instructions to offerors, and evaluation factors for award.

b. Questions and Answers (Q&A's) parts 1, 2, 3 and 4⁵³ - Appendix E

Q&A's are a result of questions arising from both an on-site visit and the solicitation for bids. The contracting office attempted to answer all potential contractor

⁵¹ See Appendix C. AF land lease Federal Business Opportunities (FedBizOps). (May 24, 2006). *Attachment 2 (Model Lease Agreement)*. Retrieved October 7, 2007, from: <http://fs2.fbo.gov/EPSTData/USAF/Synopses/885/FA4861-06-R-B501/FinalDraftPVArrayLeaseTemplate123May06.doc>.

⁵² See Appendix D. 99 CONS: Solicitation, Offer and Award, Salton George E Civ 99 CONS/CD email to Shaun Hunt, October 29, 2007.

⁵³ See Appendix E. Q&A 1 Federal Business Opportunities (FedBizOps). (May 10, 2006). *Photovoltaic Power Site Visit/Pre-Proposal Conference Questions*. Retrieved October 7, 2007, from: [http://fs2.fbo.gov/EPSTData/USAF/Synopses/885/FA4861-06-R-B501/PhotovoltaicQuestions\(WorkingDraft\)\(4\).doc](http://fs2.fbo.gov/EPSTData/USAF/Synopses/885/FA4861-06-R-B501/PhotovoltaicQuestions(WorkingDraft)(4).doc). Q&A 2 Federal Business Opportunities (FedBizOps). (May 31, 2006). *Questions and Answers Part 2*. Retrieved October 7, 2007, from: <http://fs2.fbo.gov/EPSTData/USAF/Synopses/885/FA4861-06-R-B501/Q&APart2.doc>. Q&A 3 Federal Business Opportunities (FedBizOps). (June 6, 2006). *Solar Questions and Answers part 3*. Retrieved October 7, 2007, from: <http://fs2.fbo.gov/EPSTData/USAF/Synopses/885/FA4861-06-R-B501/Q&APart3.doc>. Q&A 4 Federal Business Opportunities (FedBizOps). (June 12, 2006). *Questions and Answers Part 2*. Retrieved October 7, 2007, from: <http://fs2.fbo.gov/EPSTData/USAF/Synopses/885/FA4861-06-R-B501/Q&APart4.doc>.

questions concerning the solicitation and posted the answers for all to read, so as not to give any one contractor an unfair advantage in preparing their bid.

c. Solar Land Aerial View⁵⁴ - Appendix F

The Solar Land Aerial views are comprised of three aerial images that have been enhanced to depict real estate boundaries and land elevation, to be used by prospective bidders in designing an optimum solar solution.

d. Amendments 1, 2 and 3⁵⁵ - Appendix G

The three amendments to the original solicitation incorporate two changes to contractor proposal due date, add a Model Lease agreement and an additional section L paragraph providing clarification and formatting guidance for contractor proposals.

5. Nevada Assembly Bill No. 186⁵⁶

Nevada Assembly Bill No. 186, February 27, 2007, revises various provisions relating to energy (BDR 58-784). Sec. 9. NRS 704.7821 is hereby amended to read as follows:

704.7821 1. For each provider of electric service, the Commission shall establish a portfolio standard. The portfolio standard must require each provider to generate, acquire or save electricity from portfolio energy systems or efficiency measures in an amount that is:

⁵⁴ See Appendix F. Solar land aerial view Salton George E Civ 99 CONS/CD email to Shaun Hunt, October 29, 2007.

⁵⁵ See Appendix G. Amendment 1. Federal Business Opportunities (FedBizOps). (May 10, 2006). *FA4861-06-M-B501-Amendment 1*. Retrieved October 7, 2007, from: <http://fs2.fbo.gov/EPSTData/USAF/Synopses/885/FA4861-06-R-B501/SolarMod1.doc>. Amendment 2. Federal Business Opportunities (FedBizOps). (May 24, 2006). *Amendment 2 (RFP due date extension)*. Retrieved October 7, 2007, from: <http://fs2.fbo.gov/EPSTData/USAF/Synopses/885/FA4861-06-R-B501/Amendment2SolarPDF.pdf>. Amendment 3. Federal Business Opportunities (FedBizOps). (June 6, 2006). *Solar Amendment 3 (Section L)*. Retrieved October 7, 2007, from: <http://fs1.fbo.gov/EPSTData/USAF/Synopses/885/FA4861-06-R-B501/Amendment3SolarPDF.pdf>.

⁵⁶ See Appendix H. Nevada Legislature. (2007). *NRS 704.7821 Establishment of portfolio standard; requirements; treatment of certain solar energy systems; portfolio energy credits; renewable energy contracts and energy efficiency contracts; exemptions; regulations*. Retrieved December 7, 2007, from: <http://www.leg.state.nv.us/nrs/NRS-704.html#NRS704Sec7821>.

(a) For calendar years 2005 and 2006, not less than 6% of the total amount of electricity sold by the provider to its retail customers in this State during that calendar year.

(b) For calendar years 2007 and 2008, not less than 9% of the total amount of electricity sold by the provider to its retail customers in this State during that calendar year.

(c) For calendar years 2009 and 2010, not less than 12% of the total amount of electricity sold by the provider to its retail customers in this State during that calendar year.

(d) For calendar years 2011 and 2012, not less than 15% of the total amount of electricity sold by the provider to its retail customers in this State during that calendar year.

(e) For calendar years 2013 and 2014, not less than 18% of the total amount of electricity sold by the provider to its retail customers in this State during that calendar year.

(f) For calendar year 2015 and for each calendar year thereafter, not less than 20% of the total amount of electricity sold by the provider to its retail customers in this State during that calendar year.

2. In addition to the requirements set forth in subsection 1, the portfolio standard for each provider must require that:

(a) Of the total amount of electricity that the provider is required to generate, acquire or save from portfolio energy systems or efficiency measures during each calendar year, not less than 5% of that amount must be generated or acquired from solar renewable energy systems.

D. INTERVIEWS

The following Q&A's are derived from interviews between Mr. Steve Dumont [SD], C.E.M. at Headquarters Air Combat Command (ACC)/Mission Support (A7), Ms. Michelle Price [MP], of the 99th Civil Engineering Squadron Energy Office, conducted October 17, 2007, Mr. George Salton [GS], of the 99th Contracting Squadron, Mr. Richard D. Hanson [RH], Sr. Project Manager, SunPower Corp, Systems, and the researchers. Mr. Dumont's interview was conducted November 13, 2007. The interviews with Ms. Price and Mr. Salton were conducted October 17, 2007. Mr. Hanson's interview was conducted October 18, 2007.

Political Environment

What was the catalyst for the Nellis AFB Solar project?

[SD] Under a DoD report done by Pacific Northwest Lab in late 2003, surveying all DoD properties for RE opportunities, Nellis AFB was identified as a very likely and strong candidate for good solar resources / high potential for solar energy. As a result, ACC/A7 received a call from a private developer, PowerLight, interested in using Nellis AFB land to put in a possible 23 megawatt PV system.

[GS] When this got started, the intention was to do something for Nevada. The base wanted to do something for Nellis AFB. The Senator wanted something for Nevada. There are some people who might not have a profit motive, but may be focused on doing something for the environment.

Did the push for this Nellis AFB project originate from Federal or DoD requirements?

[SD] Because of the Federal Energy Act requirements, we (*the Air Force*) are always trying to scope out opportunities, and that is why we jumped on this when we saw the opportunity.

Has AF policy, as it relates to renewable energy sources, generated a standing order to look for RE projects?

[SD] It is part of the AF strategy to pursue RE. It is very much a part of the AF strategy. The AF is currently revamping a holistic strategy for energy. The strategy is based on what they are calling the four pillars. The first pillar is to improve current infrastructure, to do retrofits, buy better lighting and more efficient chillers and things like that. The second pillar is to improve future infrastructure, which is new design standards, such as LEAD principles, etc. The third pillar is to procure Renewable Energy. The fourth pillar is to manage utility costs, which means getting the best rates we can and to lower our costs for things like standby charges, demand charges, late fees, and everything else. We would litigate rate increases and manage utility costs. This four pillar strategy is currently being developed.

Are there any parts of the Federal Energy Act that came into play during this contracting effort?

[GS] No, other than being aware of it and understanding how it may affect the power generation business. The Federal Energy Act is really on the financing side, and is the fuel that will induce someone to do a project like this, and go into sun power.

Does base contracting conduct Davis-Bacon Act inspections?

[MP] No, they are not required to meet Davis-Bacon requirements. This is not a Government MILCON project. All Nellis AFB is doing is purchasing utilities. Nellis AFB is a landlord to the people who leased the land.

Leadership Buy-In and Commitment

How do the different levels of leadership impact this project?

[GS] There is a great debate in this country about where we get our energy. Some say we can get it cheaper, others say cheaper is not as important as being independent of foreign oil. The result is differing approaches to energy production. This brings to the point of saying, what about sun power? It's renewable and it's cheap. Some people will say it's not cheaper, but rather coal is cheaper. We live in a state that also has plenty of wind and sun. It just so happens that the Senate majority leader is from Nevada, so that helps in the voting when deciding what to do in Nevada regarding RE.

How did your understanding of the project influence acceptance?

[SD] I didn't immediately return the call, because at the time PV cost about \$0.27 per kilowatt to produce, and we were paying about \$0.075 at the time for electricity at Nellis AFB. So, I assumed there was no way this guy from PowerLight knew what he was talking about. He was talking about selling power at a price competitive in the market. About two weeks after the initial call, I received a call from Mr. Al Day, AFCESA/CES. He said he got a call from these guys who want to put a potential array at Nellis AFB, and they can make something economically feasible at Nellis AFB.

What leadership commitments are required for this type of project; and why are they important?

[MP] Nellis AFB has realized there needs to be a commitment of time from the base to the project. People had a false impression at the start, that since the contractor was doing the all of the construction, and not a MILCON project, the base involvement would be minimal. That is absolutely untrue! By comparison, consider the \$100M+ privatized housing contract at Nellis AFB that is going to take five years. Now take the PV project of similar dollar amount, and compress the construction into less than six months.

[MP] All the things that would come up during the longer five year privatized housing construction project, comes up with the PV project, but at an accelerated pace; including everything from severing a major communications line, to tapping into a power line, those kinds of major issues, getting people onto base short notice. How do you get 200 people onto base, working through Pass and ID, and Security Forces? These sorts of issues demand a serious commitment of time and personnel to support. You have to have a person dedicated/devoted to this sort of project 24/7, but unfortunately Nellis AFB does not. The responsibility is divided among several individuals, and that creates continuity issues.

[MP] ACC people said the business case must be done early in the process, because it would be used as justification for the land lease that has to be signed at the SECAF level. The business case has to be put together, and requires the legal appraisal, land survey, and land appraisal to be done. All of this must be done early to make the case for the RE project.

Federal/State/Public Utility Commission Incentives/Disincentives

What did Nevada do to encourage RE projects?

[SD] The state of Nevada legislated a RE Portfolio Standard (RPS) that requires a certain amount of not just RE, but PV RE to be produced or procured by the local power companies. It is such a hard requirement to meet because of the technology costs that it has driven the price of renewable energy credits

(RECs) up tremendously. The credits are worth more than the actual power, to the tune of approximately three times the cost of the actual power.

[SD] It turns out that one solar credit is worth approximately 3.2 regular RECs in Nevada. So when it is one credit for wind or biomass as compared to 3.2 credits for PV RECs, buyers are willing to pay more for the PV RECs.

So, what really fuels the RE projects, are when each state's Public Utility Commission (PUC) pushes the bar for REs.

[SD] The way Nevada pays for this RE standard, the PUC allows the assessment on everybody's bill of a RE tax. Every single energy user pays the small fee on their bill that goes into a fund that pays for these RECs. That's how they finance them. NPC utility isn't taking the REC cost out of their profit margin. The RECs are paid for out of the pot of money from the RE tax. The fund is regulated by the PUC.

[MP] Part of why it works financially for the Government, involves the sale of RECs to NPC. The Government (Nellis AFB) is not buying the RECs, and is only buying the power.

What else do states use to encourage RE development?

[SD] Most think of CA as a pro-renewable state. The way they do most of their renewables is through rebates. They really are not driving the market to make a project like Nellis AFB economically feasible. The rebates only go up to about \$1M, so on a project that costs \$100M or more, it is fairly insignificant as an incentive.

How did the Nevada PUC contribute to the calculated savings of approximately \$1M per year?

[SD] That was the initial projection for cost savings. Since then, the savings dropped a little bit because the base went on a slightly lower tariff between the time this started and while they have been building this. Therefore, the baseline price (cost for power) went down, thus our savings went down. However, we are now in negotiations with NPC, and feel we have a strong

argument for not getting standby charges. If we eliminate those standby charges, our saving will go way up again.

Did Nellis AFB have to consult the Public Utility Commission of Nevada (PUCN)?

[MP] Yes, the PV array is a utility recognized by the PUCN. It is considered a power plant. This company is building a power plant of base land and had to get approved by the PUCN. The base did not have any formal representation in the PUCN approval process, other than sending a letter stating the base supports this project. The company is responsible for making a bid to become a power producer in the state of Nevada. Before they can officially be recognized as producing power, there is commissioning process for Nevada power generation companies. The process is approximately 15 pages of requirements that must be met, including metering, and supporting data for the commissioning process. As the three phases of the project come online, they must be commissioned.

Utility Industry Issues

Do you expect the standby charges to increase?

[SD] Nellis AFB does not pay them at all now. We have someone who used to be on the PUC, who is now a consultant for the AF, that said there is a Nevada statute or a rule under the tariffs that says PV cannot be charged standby tariffs. This has the potential to save the AF a lot of money.

Is there a concern that the standby rates will be raised by the PUC, since NPC cannot maintain the excess power production standby capacity without the cost being assessed to its customers?

[SD] The argument on this is our system is totally distributed. At the end of each row of connected panels there is an inverter that converts is to AC. Then so many inverters are pulled together into a transformer, and that transformer feeds directly into the power grid. So if anything is going to fail is one transformer. So we might have 5% go down on the entire array at any one time.

On this particular project, I think it is even less, the most determined that would fail at a time is a quarter megawatt. Therefore, it is a very graceful degradation. In reality, the chances of having the entire array catastrophically fail is essentially nil. The only thing we think we could be charge standby on is the potential of one 250 kW subsystem failing that they would have to back us up on. It is not one single big system that could fail all at once. It is like having fifty quarter MW systems online.

Since the tariffs and rate structures are controlled by PUCs, do you have any thoughts or opinions on how they may impact the equation?

[SD] The savings have gone down a little due the new rate schedule, but still close to original \$1M estimate in savings. We will not know the actual savings until we get the bills, and even then, we may still not know because of possible changes on the base loads.

[SD] Each state does it differently, and Nevada is taking the lead in it. It is hard to predict at times. The rates do affect the potential for renewables. The higher the rates the more competitive you are with renewables.

Does the AF engage in dialogue with the PUC, or provide other information when projects such as Nellis AFB are to be approved?

[SD] We did not need to get approval for SunPower to build the array. They did need to get approval for NPC to buy the RECs from SunPower.

There are several businesses involved in this project. How are they related?

[MP] PowerLight, now a subsidiary of SunPower, started the project. SunPower is building the array, and about the time of construction, they created a wholly owned subsidiary called SolarStar Nellis AFB, LLC. They did this for business purposes. They then sold SolarStar NAFB, LLC to MMA Renewables, LLC, a finance company. Now SunPower is doing the construction for MMA, and MMA will operate the array for the next 20 years. It worked to create the subsidiary for legal documentation purposed.

[MP] There was no direct relationship between Nellis AFB and MMA, but MMA now owned SolarStar NAFB, LLC. Nellis AFB required MMA to provide

legal documentation to prove they owned SolarStar NAFB, as MMA will be on-site operating the array for the next 20 years. The documentation was key to establishing a working relationship with Nellis AFB and for billing purposes.

What is the current relationship between Nellis AFB, MMA and NPC?

[MP] Nellis AFB buys the power from MMA cheaper than they would have bought it from NPC. MMA sells the RECs to NPC. NPC buys the credits in order to meet portfolio requirements handed down by the state. A certain percentage of their power must come from RE, and furthermore, a certain percentage of the RE must be from solar. The base in essence is helping NPC meet their goals for RE, and is why NPC was partnering in this project.

[MP] MMA and NPC have their own agreement specifying rates for the RECs and their working relationship. The particulars of this agreement are confidential between those parties. All Nellis AFB knows is it makes a \$100M+ project economically viable over the course of 20 years. It will pay back in less than 20 years, and MMA has investors, including CitiBank, All State, and others with RE portfolios. This project is financially beneficial for MMA, their investors, SunPower and Nellis AFB. The only party that this may not be directly financially beneficial for is NPC, but it is still beneficial to them in order to meet their RE goals. Indirectly, if NPC does not meet their RE goals, the state will levy fines.

How do Nevada's net metering laws affect the project?

[MP] Nevada does not have customer friendly net metering laws. It was necessary for the PV array to be on base land and to tie into the base grid to deliver power. Otherwise, had the facility been geographically separated from the base, NPC would have had significantly more bargaining power. If any new power company gets approved by the PUCN, NPC has to take the power. However, they do not have to buy the RECs.

Were there any attempts to account for the possible variation in rates when figuring the payback period?

[MP] The tariff will go up over the next 20 years. The power purchase agreement rate with SunPower is locked for the next 20 years. While other costs

may rise, the risk for return on investment falls to the contractor. Nevada does have a green power charge that appears on all customer bills. This use adjusted fee results in everyone paying a little towards the related cost of green power generation in Nevada.

Did placing the solar array over an old landfill pose any issues or added costs?

[MP] Of the 140 acres used in this project, 33 acres are a capped landfill. Normally, before you can use an old landfill for other purposes, the responsible party must complete remediation of the land, and completely clean up the area. Since this project sets on top of the land fill, Nellis AFB did not have to clean up the site at all. They were able to use the old landfill that had previously been unusable for anything else.

Are there risks with having the construction of the entire solar array financed by SunPower?

[GS] The contract is not the problem; the challenge is the political aspect (of MMA attracting investors). Now we are talking about a contractor investing heavily in this project, putting it in, and then start getting money back at a rate that is acceptable to the investor. There are negotiations behind the scenes with venture capitalists and entrepreneurs. I would advise the contracting officer to stay out of the political aspect. The entrepreneur sets up the deal then sells it off to another party before it is complete. The dangerous part is right in the middle when the entrepreneur has assumed virtually all the liability and has yet to sell it to other investors. So the contracting officer has to keep visibility of the effort to ensure there is not a scam, or some other dubious activity, while the project gets completed. The contracting element is working with the local utilities. You have to buy power, when you are not getting PV power. You buy from the local utilities. Your price is derived partly from law, by way of tax credits, and renewable energy credits.

Contracting Vehicles

How do RE requirements normally flow to the base? Are the bases proactive, or do they take direction from a higher Federal authority?

[GS] The requirements flow down the chain of command. Our direction came from HQ ACC, and they got it from SAF. SAF got it from SECAF, which came from DoD, who probably got it from the Environmental Secretary, etc.

How did this solar energy project requirement originate? Who at Nellis AFB received the requirements?

[MP] It started with contractors, PowerLight and others, approaching the base in 2004, with unsolicited proposals to install PV in the desert surrounding Nellis AFB. They approached Nevada Power Company (NPC) and the base about installing a large PV project in the area. Idea got kicked around, NPC mulled over for awhile and put it together as a project and put out an RFP. The issue Nellis AFB had with that is that when NPC chose a contractor, they are the ones selecting the contractor, not Nellis AFB. This was something that really should have been put out by the Government. NPC had issues and had objections to who they selected and instead of dealing with those issues, they requested Nellis AFB put out an RFP and they pulled theirs back.

How did the AF go about analyzing the unsolicited proposal?

[SD] I gathered the actual load data for one year from Nellis AFB, in the form of 15 minute interval data. In other words, what the power usage was for every 15 minutes throughout the year. I then built a model that would calculate what the bill should be, based on the actual rate structure at Nellis AFB. It is a very complex rate structure, and not just a fixed rate per kilowatt hour. They have peak, mid-peak, off-peak, summer and winter demand and energy rates. In addition to these there are quite a few other charges and it gets rather confusing very quickly. The model computed what Nellis AFB would be charged for each 15 minute interval, which was compared to the actual bills. The model was then fine-tuned to make sure it matched the real bills. Now the model was accurately predicting what their tariffs would require.

[SD] The next step was to input the expected output from the proposed PV array at Nellis AFB, in kilowatts, and subtracted this number from the actual usage for the base, as if this array was already on the base. The resulting amount would be power Nellis AFB would still have to buy off the grid from the power company. After doing a quick computation using the model and applicable rate structure with tariffs, the AF was able to see how much lower the bill would be by comparison to historical data.

[SD] If you have generation on base over a certain amount, you normally pay standby and backup demand charges. Standby tariffs were added into the model. The total bill for Nellis AFB was less than what the bill would be without the PV array. The model identifies how much money Nellis AFB would save by having the PV array, and how much they could afford to pay for power. The amount of money saved divided by the output of the PV array in kilowatt hours determined how much Nellis AFB could afford to pay. There was an economic potential there, and enough savings to allow PowerLight to charge at or below current market rates and still make money. At that point, I contacted PowerLight, and said I think we have something here. Let's talk.

How did the project proceed?

[SD] PowerLight wanted to submit an unsolicited proposal to NPC, and have Nellis AFB sign on as an interested party. ACC/A7 had to get a letter of interest signed by the AF. I went to the CE commander for ACC to sign the letter of interest. It stated the AF would be interested in partnering with PowerLight in putting this together if the price is right, and it was economical for the AF. We always have to put that caveat. They took the letter and proposal, and submitted them to NPC. NPC reviewed the proposal. Instead of saying it was a great idea and let's do this, NPC said they had a solicitation going on the street to procure all kinds of renewable power and suggested PowerLight submit under that solicitation. May 4, 2005, NPC issued their RFP.

[SD] During the timeframe the company was waiting on the due date on the solicitation to NPC, so they could submit it, two other vendors caught wind of

the idea and approached ACC/A7 to do the same thing, asking if we would work with them if they went through NPC, using the same land. The AF would work with anybody NPC selected. There ended up being three vendors who submitted proposals under that solicitation to NPC. One of the vendors was selected as a tier one choice. This meant NPC would negotiate with them as their first choice, and leave the other two potential vendors in the wings waiting to see if the number one choice could come up with an agreement that was amicable to both parties.

[SD] In January 2006, NPC named the tier one company, and ACC began discussions with them using a sole source justification. They were the only company that could possibly build a system, as they were the only one NPC at the time was considering. At the same time ACC was negotiating with PowerLight, PowerLight was negotiating with NPC. They had to do it this way because they couldn't offer a price to NPC for the RECs without knowing how much Nellis AFB was willing to pay for the power, because the total had to add up to a certain amount to pay for the array.

[SD] About halfway through the negotiations, NPC decided that it was too hard to make the decision, due to political pressure that was brought to bear, as everyone of those companies had someone they knew who was in Congress or local government, who were putting pressure on NPC to pick them. February 26, 2006, NPC sent letter to ACC/A7 asking the AF to make the selection as they couldn't do it. We told them we would be happy to choose, but couldn't do it under their solicitation. We would have to put our own out.

How did Nellis AFB start the contracting process?

[GS] Personnel from HQ ACC Energy Office and AFCESA walked into 99 CONS, Nellis AFB, and stated they wanted to buy solar energy. It is interesting because as you start drilling down, it is not certain what you are buying. They had an ambitious schedule. I told them for this to work they needed to stay and work through the requirements process. We had to write the Statement of Work. I told them if we came to a point where we needed additional information, we would get that person on the phone, VTC, etc., to get the needed

information. You have to capture this critical information when it is available. It was available while they were here. I had over 90% of the SOW right there.

[GS] Then they said they wanted sole source. What do you mean sole source? What about small business? What about large business? Those are the things you have to go through, because you have to talk about them. Then I asked them what are you buying? They said we are going to buy solar energy. I asked if they cared how I got the sun power. Yes, they did. They wanted a solar farm. They said that was the case, and furthermore, they were going to allow them to put it on Government land. I asked if it was a requirement that it was on Government land or are you going to include a lease should they want to build it on Government land? Some third party financing requires some sort of claim to the land. They must build something useful for us on it. This process took awhile, but it was important for us to have a clear vision of what it is we are buying, because we are going to ask people to give us a bid, and we will rate them on meeting our needs.

[GS] We started to define the scope and limitations of the proposed project. The goal was to have a product for everyone to take back with them, sign off, and return in a short amount of time. This was challenging because there was no template for it. We created a contract with a lease feature. The winning contractor made the decision to take advantage of the lease offer and build the facility on Nellis AFB.

[SD] We formed an Acquisition Team on March 7, 2006.

[MP] Nellis AFB put together an RFP. Mr. Rogers, deputy base civil engineer, one of the critical people getting the project started. It's an RFP with a sample lease and sample power purchase that was issued. Nellis AFB did not contract for construction. They contracted for a utilities contract. Nellis AFB wanted to get electric power at a cheaper rate and the Government would allow them to build on its land as a result. It was kind of like an Enhance Use Lease (EUL), but not exactly.

[SD] An RFP was issued on April 18, 2006. Proposals were due in by June 16, 2006. We began selection on June 23rd. On July 27, 2006, we made the selection. Of course, it took a few weeks to award. In between, we had a protest. There was a GAO protest based on the fact that no one else who bid could have reasonably been considered a bidder, because no one else could have conceivably had know what NPC would be willing to pay for the RECs, because no one else was a tier one contractor for NPC. They never previously had a chance to negotiate with them and know what they are willing to pay for the RECs. No one other than the Tier one contractor could put forth a reasonable proposal.

[SD] The protest was denied by GAO on that logic, but GAO sustained the protest for totally different reasons. They said that in looking at the winner of the proposals, the low bidder had a potential contingency in their proposal that implied they would sell Nellis AFB power at this offered rate, if they could sell RECs to NPC at this other rate. There were to be no contingencies as part of the RFP. Each bidder had to clarify if they have been offering with or without contingencies. The low bidder verified they did not have contingencies; they had a firm offer no matter what NPC came back with on their price. We were able to keep the award to the low bidder and ended up with a price of \$0.0222 for the power. The GAO decision was on October 30, 2006. At that point we could start the full process of negotiating the power purchase agreement. We could also commence with congressional notification.

[SD] Congressional notification was required for the 20 year land lease. We also had to have the lease reviewed and approved by the SAF/IEI for the same 20 year lease reason.

How did you go about selecting the low bidder?

[MP] There was a group put together to evaluate the bid proposals. Basically, there were two people from CE, a couple contracting officers, people from utilities, legal representatives from base, people from utilities litigation at AFCESA, people from ACC Energy Branch at Command. From the lessons learned brief, they believed it should be a small core team. It should not be a large

team, because when it is a large team you get into issues when trying to get things done quickly, so they put together a small core team.

[SD] First of all, they had to pass the test it was cheaper to buy power from them than the status quo. It had to be more economic for the Government. We took the total payments to buy the contractor's power, over the 20 years. Each contractor bid a cost for power and an escalation cost. Theoretical, a guy could have bid \$0.06, escalating at 3% per year, and another guy could have bid \$0.07, escalating at 1% per year, and that \$0.07 bidder may be cheaper over the long run, because of the lower escalation rate. We used a present value calculation of all the payments that would be made to the contractor over the 20 years, under their proposed rate schedule. Then we picked the overall low bidder using lowest present value.

You used contract by negotiations, which instead of going for the lowest technically acceptable price, you were looking at the best value, where other factors are weighed in such as past performance, quality, etc?

[MP] Yes, but it still ended up going to the low bidder as a result. So it ended up being technically acceptable, best value for what they had presented.

How many proposals were submitted?

[MP] Three proposals were submitted; and it was the same three people who responded to NPC's solicitation. The project was evaluated and was awarded to a company called Sun Edison, that is not who is building the array. It was awarded to SunPower, and the other bidders protested. We still ended up working with the original company the Government awarded to, which is PowerLight (now a subsidiary of SunPower). They bid to do the construction, and everything.

What about using an Enhanced Use Lease (EUL) for the land?⁵⁷

[SD] You might find references that Nellis AFB was done under an EUL, but it was not. EUL is a process that you go through to identify potential uses for

⁵⁷ The Air Force Real Property Agency's EUL handbook, dated March 30, 2007, states an EUL is a lease between the Air Force and some public or private interest that is willing to pay fair market rental value for the use of an Air Force asset. The typical EUL project should be approached in five phases: (1) Project Identification, (2) Project Definition and Acquisition, (3) Lease Negotiation and Closing, (4) Project Management, and (5) Project Closeout.

Federal land. We did not use the EUL process, but did use the legislative authority to lease the land. Nellis AFB did a power purchase agreement, which is essentially a utility agreement to buy power, and a 20 year land lease. We did not do the EUL process at all, as it would have taken us two to two and half years to complete at a cost of \$1M, give or take a few hundred thousand dollars.

[SD] If you are going to build something on base land, and its purpose is not to serve the base, but to serve some other commercial purpose, and they are going to be providing a service for off base purposes or are going produce power and sell it to off-base users, then you would use EUL. Basically, here is land for a contractor's commercial use not benefiting the base, and the contractor will provide the base fair market value for the use of the land. This is where EUL has a place. Since all the power produced will be consumed by Nellis AFB, it really did not have true EUL potential.

When you decided to use the EUL structure to proceed with this effort; did you do so because the Government lacked a better process for such a project?

[MP] There were lots of good reasons for using a lease, rather than purchase the generation capability. Nellis AFB does not have to maintain, does not need the personnel to maintain it. The Government won't own it, so if something happens to it; it is not the Government's responsibility. They will have to have people out here to operate it, and Nellis AFB still saves money as they are getting the power at a cheaper rate. So the Government put it forward as a land lease with a power purchase agreement.

[MP] It can be confused with being an EUL, and there is an EUL process that has to be followed, and there are boxes you have to check (requirements), to say you are officially an EUL. Nellis AFB is not an EUL, but is called a land lease with a power purchase agreement. This is what was put out as the RFP. Bidders submitted what they thought they could put in the acreage provided, 140 acres. So given this many acres, they said they could provide at this rate to you, at this many kilowatt hours, over this many years.

[MP] Nellis AFB used the leasing authority in the EUL, to lease the land for benefit to the Government. If you review the EUL process in the AF, it is a complicated and long process. That is not was done at Nellis AFB. It is a land lease they put out an RFP for, where they could lease the land for 20 years and install the power generation system and they would have to sell the base the power at a cheaper rate, and they would also have to own, operate and maintain the power generation system.

[MP] The decision was made by the lawyers early on that using the leasing authority instead of EUL, was the best way to proceed, as it was quicker and more cost effective. EUL office would like for bases to come to them with a proposal, for example: where they have 20 acres and want to put a PV array on it. The EUL office would conduct a use survey over the course of several months and at a significant cost of \$500k to \$1M, to tell them they have 20 acres they could put a PV array on.

[MP] As the researcher understands, Nellis AFB had to do an environmental baseline study, a business case analysis, legal appraisal, and land lease survey. There appears to be some overlap in conducting these studies, and they appear to duplicate much of what would have come from an EUL study. Do you see any specific ways to streamline the steps in the process into one product?

[MP] The EBS has to be done in order to use the land for anything. The legal appraisal is something you would have to do as part of the EUL. The legal appraisal and the survey and the land appraisal are things you normally do for the EUL and as part of the business case study. You have to prove it is more financially beneficial to Government to lease this land and allow someone to build on it without charging them anything to lease the land. That it will still be financially beneficial for the Government to do that, that the land could not be used for something else to make more money. All of this is part of the business case.

Would it be more beneficial to have a DoD level energy policy or process for similar projects, rather than using EUL?

[MP] Yes, there is no reason to have to do an EUL, when you have the land and an identified RE project. The only reason to do an EUL is when you are unaware of your land's potential, or if you are unaware of a business that might have an interest in using the land, and you want to find out. Then you could use the land to generate funds for the Government. Anyone can use the leasing authority for similar projects.

[MP] As for having specific guidance stating that for RE projects, bases do not need to use EUL process, I don't see it happening due to the political power struggle issue. It would be worthwhile to pursue developing the leasing authority for identified projects and work it locally through the contracting office.

What key lessons learned came out of the contracting process?

[MP] Mr. Salton will say what he found most remarkable with this process, was they were able to get everything done so quickly. There weren't meetings and meetings and meetings to discuss stuff. There were meetings and decisions made, and they were able to move on. You get a core team who understands the background of the project and you put them all together, they can make informed decisions. So they evaluated the proposals and came up with best value. In the briefing provided, it says what they were evaluating was based on. And because that was one of the biggest concerns, you cannot just accept the low bidder on this, you have to get technically acceptable or you'll have 20years of problems.

[MP] From a contracting perspective, looking at all the documents that needed signed. Many of them were not contracting documents, but were legal documents. We had to have an interconnect agreement with the contractor. How they were going to interconnect with the base. We had to have an operating agreement. Then had to have a interconnect agreement between Nellis AFB and NPC, to address how the system Nellis AFB contracted with will connect with NPC.

[MP] Once everything is completed, then you have to have the lease officially signed. And that has to be done at Air Staff (Pentagon), by an SES (Mr. Kuhn). When you do a land lease such as this, it requires SAF's (SAF/IE?) signature/approval. An important point they realized, was that if you want the process to move fast, early on you need to have an environmental assessment of the land completed. You need to have a legal appraisal of the land completed.

[MP] This is because you have to make the business case that it is actually better to put in a power plant, than it would be to let someone else use/buy the land and place a mall on it. To make the business case you have to have the appraisal, they did a yellow book appraisal for Nellis AFB, meaning that it is comprised of standard commercial prices. Then you have to have a legal survey of the area.

[MP] Those are the things you really need to have completed up front early on, before you move forward. These things are difficult to coordinate if you have already started moving forward. So if you already have the EBS (Environmental Baseline Survey) and the legal appraisal and the legal survey done, those are the only things that are going to cost the Government anything. The legal appraisal was paid for at SAF, but the others are paid for by the base. So basically, those are the funds you have to come up with, basically a few hundred thousand dollars.

[MP] Once you have all that done, you can actually, it is not a bad thing that even if you decide not to do a PV array, but decide to some other renewable project, then you already have the EBS done for the area. You'll have to have the same documents no matter what kind of project you are going to put in that area. If you were going to lease the land, you'd need the meets and bounds legal survey. You have to have these things done, and that is the only costs. The rest of it is at no cost to the base, and that is the benefit of doing a land lease power agreement. The cost of the project is somewhere between \$115 – 130M dollars, and the Government doesn't have to pay any of it.

In 20 years, when the lease is up, and the contractor must vacate the premises, does the contract state how the land must be returned to its original condition?

[MP] Yes, they would be required to return the land to the way they found it, and remove all their stuff.

[MP] As a new landlord, the base has gone through a learning experience. Nellis AFB has had to learn whose responsibility is what. Because they leased the land, they are not guided by the contracting officer, which is very interesting. The contracting officer guides the utility and guides the lease in some respects. If they are meeting the terms of their lease, and a construction issue arises that is not address in the terms of the contract or lease, then CE must provide the necessary guidance. They have had to have a lot of people involved from CE, especially the Real Property Office.

As a Power Purchase Agreement with a land lease, describe the AF Real Property Offices' roles for this type of contract.

[MP] They key players must be involved early on and know about the entire project in order to provide competent support. Because it is a lease of land, there is a tremendous amount of involvement from the Real Property Office addressing the related property issues. There has been much learning and discovering all the related specifics. There is the leased land over here, and they must come off the leased land to connect to the existing power grid, that is not on their leased land. How do they get from there to here? They have to run lines, and there must be a legal document that allows them to come off their land and come onto the base land for connection purposes. Where does this documentation reside? It has to be within the lease or it has to be a license or something. And the realization of these issues has come late in the game, so the Government now has to go back and amend the lease to include the necessary documentation allowing them to come to these connection areas.

[MP] Specifics, such as where does your responsibility for maintaining the connection line end and ours starts? Nobody had previously discussed this before,

but the base has realized now that such things must be contained within an operating agreement, that spells out for the people who will be there to do the maintenance for the next 20 years. Other situations should be spelled out in the operating agreement, like when there is a power outage, who is suppose to let the other party know. These areas will have to be legally surveyed by a licensed surveyor that shows the specific coordinate points, in order to provide the required documentation and fulfill all legal requirements.

[MP] Fortunately, the Real Property Office has been instrumental in identifying these sorts of requirements, and assisting in getting all the required documentation completed. This is important on such a long contract, as there will be significant turnover over the next 20 years. Detailed documentation lets someone else manage the program in the future.

What are some of the challenges the contractor is experiencing in executing the contract?

[RH] I primarily deal with the contracting department, and they have changed personnel three times in a very short period of time. Each person takes time to get up to speed.

How many contracting officers does the contractor work with from the contracting squadron?

[RH] They have designated a POC, Sgt Coleman, the contract administrator, who in-turn reports to Mr. Hitchcock, who is the actual CO. So far our demands have been fairly light. Our biggest issue is with gate access, getting contractors in to work. At the peak last month, there were 200 workers on site. The contract requirement is to provide access request 15 days in advance, to include detailed personal and vehicle information.

What is the most significant construction issue for SunPower?

[RH] Since we are doing a lot of work in a compressed amount of time, we had an issue come up where we needed a crew of workers on site within a few days. The 15 day requirement is pretty impractical. In my next contract, I would

push for incorporating some sort of expedited access process, or utilize some sort of free zone, possibly moving the perimeter fence during construction.

[RH] It would be convenient and a time saver, if the supervisor or foreman was able to vouch for some of the employees, escorting them at the worksite. Right now, I have to submit a visit request and wait a couple, few weeks for a response. On some occasions, I am able to get a CE person to escort my temporary guest.

Do you have any suggestions for minimizing base/worksite accessibility delays?

[RH] The best solution is to quarantine the area during construction, allowing free contractor access zone. It is expensive to deal with delays, especially when hiring local unionized labor. Another solution would be to clear a contractor person to vouch for others would alleviate the need for short notice CE support. Preventing the delays would directly equate to lower contract costs.

What about other jobsite support for the contractor?

[MP] Only recently, has CE been given a person to conduct construction inspections. Construction inspection is a whole new territory for CE. The Government doesn't care how they build it. They leased the land. All CE cares about is how what they are doing on the leased land will effect the base. CE cares about environmental issue, because such issues requires the base to do remediation on, either now or in 20 years when their lease is up. CE cares about the need to extend off the leased land in order to connect to the base power grid. CE cares about the grading and how it will affect water drainage. CE is concerned with them following the safety and security procedures of the base, but within the lease, the Government does not require them to follow AF standards during construction. It is their leased land.

Application to other programs

Is it possible to develop a similar model for RE, in general, to be used at other installations?

[SD] It really depends on how each state's PUC wants to push REs and how they want to structure their portfolio requirements. Davis-Monthan AFB's PUC is closer to Nellis AFB's model, than to CA's RE model.

[SD] It can be done, but to do it to a significant level of detail needed for computing more accurate costs, the model must be customized to each location due to each base having their own profiles. Each base will have their own rate structure, their own tariff structure and schedule. The model will have to have the related tariff structure added into it. You cannot just change the numbers in the formulas, as the way they will be applied is also different for each different power company.

Have any other bases in the southwestern region built solar power generation facilities?

[MP] Edwards, Creech, Luke, and DM have not done any solar. Nellis AFB is leading the way with PV Solar and what has been accomplished at Nellis AFB may be applied elsewhere.

Are you currently working on models for any other bases?

[SD] Not right now. I am looking at a potential solid waste generation project at DM. It will be awhile before we get to a point of modeling this location. It would work the same way as at Nellis AFB. We would lease the land and the contractor would own and operate the facility, selling power to the base.

[SD] There is a strong green contingent, and that is creating some problems, as they do not like the idea of burning trash. Burning trash to produce power is not considered a renewable energy by the Federal Government.

How do net metering laws affect the project?

[MP] The Oregon Army National Guard wants to build a similar project, but the plant will be located away from the using installations. Their state allows for net metering, and the PV plant output would be tracked and the installation

usage would be tracked. Because of state laws, they will be able to utilize off-site power generation and be able to realize the full benefits from the negotiated rate.

Do you have any recommendations for projects dealing with solar energy to make it more reproducible?

[SD] First, a lot of people ask how to duplicate, but it is not that simple. The thing to do is keep your eyes open to opportunities. We got lucky. If we had done this thing 3 months later, we would not have had an award. There were so many people interested in selling RECs in Nevada to NPC that somebody else would have gotten to them and sold them the RECs they needed, and NPC would not have had to buy anymore, eliminating the rest of the market for RECs. We were lucky to get in there right when we did.

[SD] Monitor your state incentives. Look at what's out there, and is going to make the market favorable for RE projects, and once you find that, you have to jump on the opportunity right away. When it comes to executing and jumping on it, once you think you have something economic, establish a core team of 4-8 people max. They will put it all together and keep it going. If the team gets too big, it will become a bureaucracy, and the effort will slow down and be dragged down by too many people and approval levels.

What are the key components needed for a successful RE project?

[SD] Baram's theorem states to make a project work you must have three things: 1. Economics, 2. Engineering, 3. Politics. In this case, politics was the legal component. We had a utilities lawyer on our team. Without her expertise, we couldn't have got this done. We had engineers who understood the technical aspect of the project. We had a contracting person on the team, because without a contracting person, we would be an outsider trying to work with the contracting folks, trying to sell them on how to do this. The process we wanted to use for our solicitation and our selection, so made the CO part of the team and he took ownership of his part. Lastly, we had a person working the economics portion, which was my model. We had all the critical components necessary. I'd suggest

considering an environmental person. Now a PV array doesn't have nearly the environmental impact that say, a windmill or waste energy plant.

How does having the right team aid in leadership buy-in?

[SD] The point is to have a core team and have your most important expertise on the core team. *When you put your team together, you must make sure you have a champion on-site.* The deputy CE was our champion at Nellis AFB. We had a good relationship with him and he took this on and said he wanted to do this and run with it. He pushed stuff up the chain, sold his management and sold base leadership on it. That was the political side of the game. It had to get the political part done, because if it didn't get leadership support, it wasn't going to happen. That is what made it work for us. These opportunities are hard to find. We got lucky. There are a lot of environmental concerns overseas that would require careful assessment.

What are lessons learned on the process for applying this to another base?

[GS] First of all, gather all the players and share expectations. Do not assume anything. Share expectations in terms of product, process, and timeframe, all of those things. Second, understand your own peculiar circumstances, such as what are the state regulations, what are the county regulations, what are the kind of things in the environment that may have an impact on what you are about to do or achieve.

[GS] You need to understand how a potential provider makes a profit, and the business of solar power. The technology changes so fast, that the product that is being delivered today is probably close to obsolete to what is being created. Are you buying obsolete technology? Does it matter? Is the contractor providing you a product that requires intense maintenance? That is to say will their maintenance cost rise faster than their revenue? How will all of this impact our ability to obtain sun power?

[GS] You have to flush it out, and describe what this thing is going to look like in the end. What are you going to provide? What kind of land are you going to provide? What kind of rights are underneath the land? There are both

contracting and real estate components to this venture. Real estate laws are much less flexible, than traditional contracting.

[GS] Once they set down and defined the requirements, the parties were relieved. They finally understood what they were buying and could effectively explain it to everyone else. So instead of speaking in broad generalities, they were now much more specific. Now they know this is a more entrepreneurial venture, rather than a large established corporation. This involves a real estate transfer, which is significant. It is also political, in the sense it broaches a national topic. Administrations will be elected and changed. It is important to keep it transparent.

How was this project accelerated, as compared to a traditional MILCON contract?

[MP] Many people are surprised by how fast the construction is going. But they are thinking in terms of years of working with the Air Force, seeing MILCON projects that go on forever. You are use to seeing construction start and two years from now, you still see construction. You do you get \$130M worth of construction done in a few months. It gets done when it is financially beneficial to you (the contractor). It is financially beneficial to them to finish it, because once they finish, they start making money. They don't make money until they finish. So, they want to go as fast and furious as they can. For the Government, it is more of a concern to hold the reigns on them, to make sure they are following proper base procedures. They will go as fast as the Government will let them.

Can you provide a step-by-step description on how a similar RE project should work? What changes would you make, or what would you have done differently? Would you change the timeline?

[MP] The EBS and legal survey needs to be done first. They need to be done before the RFP goes out. You need to be able to tell the people who bid the exact boundaries of the land to be used, and this is what you need to do. The issue with all the little pieces, such as where they come off the land and connect to the grid, must be covered in some language, but you will not know until they submit a design where these connections may need to be made.

[MP] The RFP doesn't include a final design. It is a proposal and you will not know where they need to connect until you get into the nitty-gritty of the proposal. Language should state that areas must be identified where they will come off the leased land to connect with the grid, and provide the contractor the process they will need to follow for that. Many things were done perfectly, in how they evaluated the bids and moved forward.

[MP] A single point of contact and alternate for the contractor must be identified early in the project. The parties involved thought having a single POC would be a negative, but found the opposite to be true. Prior to the single POC, the contractor had worked directly with the Real Property Office, but the other parties did not have awareness of what was discussed. The same thing was happening with the Legal Office. No body knew all the pieces that were going on. Having a single POC (program manager) ensures key people know the right information.

[MP] You have to have a dedicated person for such a large project. A project of this scope really requires 24/7 support. Early on, another plus is to identify as many key players as possible, from a Real Property person at the base level, legal representation at the base level, contracting at the base level, and base level CE. Then get the AF Civil Engineer Support Agency Utilities Litigation Team involved early on, and they were in this project. Also, the ACC Energy guys, the command energy people need to be involved early on, because those are all your most experienced people in doing something like this. Once you get all those people together as your team, you are usually pretty good.

[MP] I found that having two lawyers is good because basically, if one isn't available to review the other would be. For example the interconnect agreement: given the normal amount of time needed to staff such documents within the AF doesn't coincide with such an aggressive and fast paced project. You may get a document on a Wednesday, and need it signed by Friday at the Wing level. How do you get that done? Well you have a lawyer identified, who gets the document and can walk over to the Wing Commander's Office to get it

signed. The lawyer's accessibility to the Wing Commander is something most other personnel and CE personnel, do not have, and it is key to keeping things moving. It is critical for legal documents.

[MP] The lease is signed at the AF level, and all other documents are signed at the Wing/base level. The installation commander must be involved and understand their role and know that timeliness is key step in signing the required documentation. It is important to keep the installation commander informed and aware of the project's progress. It is important to have a project manager who is aware of everything. You need to have a construction inspector involved from day one, and environmental inspector from day one.

[MP] Since Environmental issues, such as dust, water and drainage, are documented in the lease, the contractor must follow all environmental regulations at the state and local levels, to include dust control issues. Some people at the base were concerned the base would be cited for violations. Remember, it is not the base's land, but the contractor's leased land, and they would be cited for any violations.

[MP] First, CE's role is to ensure the base is not painted as someone who is violating all these environmental rules. Secondly, CE doesn't want construction stopped because of they violated an environmental rule. It is a very real possibility that the state environmental enforcement people could come out to the base and if they find the contractor is not following the rules, shut them down until they are able to fully comply. CE does not want this to happen, so they used their own level of internal oversight to tell the contractor that they identified potential issues that needed immediate attention or the state will shut them down when they find it. CE's efforts have helped keep construction moving along without interruptions. Getting environmental involved was important.

[GS] Once the contractor obtained the land lease, they were responsible for their conduct on it, to include adhering to EPA regulations during construction. Any violations would be assessed to the contractor and not the base. It is not a MILCON contract.

[MP] The contractor found there was several things they had not planned for and had to make changes, for example, they hired their own environmental person to assist with their construction. They hired an outside contractor to look at their water drainage. Once identified, they took the necessary corrective and preemptive measures. Many of these measures are things CE would not have thought of doing, had they not contacted a base environmental inspector to go out and take a look.

[MP] It is advantageous to have a construction inspector involved from the very beginning. They will need to coordinate activities, such as connecting to the base grid, and a significant number of power outages. It is critical to have someone involved who knows what is going on at all times. The initial impression would be you would not need many people involved since the contractor is doing all the construction, but there is a very real need for the right personnel support to keep things moving and to mitigate issues.

[MP] The AF followed as good of a process as you can for soliciting the project and getting that moved along quickly, and there doesn't seem to be anything there to correct.

You mentioned you used the Enhanced Use Lease (EUL) framework for this renewable energy project, but did not abide by all its rules and requirements. What would you change to streamline the process with regards to EUL when pursuing a renewable energy project?

[MP] You can do any RE project using the Nellis AFB model. An EUL must go through the AF Real Property Association, because they manage the lands of the AF. You have to go through them. They hired a contractor to do the EUL studies. So last year, instead of doing the RFP, say we wanted to do an EUL. We would have contacted AFRPA. 2-3 months later, a contractor from AFRPA would show up to evaluate the land and say that the base may be able to do a RE project on it. It takes 2-3 months for the study, and cost the AF \$500k-1M to

complete the study. At the end of the study, they would have come back, and said it was appropriate to put a PV array on the land. That's a waste of a year's time and a million dollars.

[MP] Nellis AFB felt they didn't need another party to evaluate the land, since they already had contractors approach with unsolicited power proposals saying it was a good project. Nellis AFB already was convinced it was a good project ahead of time. Now EUL program does have value when you have some land you have no idea what to do with it. They will come in and evaluate it and provide recommendations for land use. Nellis AFB on the other hand, had land and knew what to do with it. Nellis AFB felt there was no need for further discussion or studies. You can use the leasing authority within the AF. Using this authority, you can go straight to them.

[MP] AFRPA doesn't like to be circumvented and has tried to cut the leasing authority off. So other installations will not be able to proceed with leasing land without their use study. They want control of it and want all leasing to go through EUL. This is a political power struggle. The EUL people came to meet with CE Energy Office on three occasions, wanting to call this an EUL agreement, but they know this project doesn't meet all their requirements for an EUL, so their hands appear to be tied. The EUL contractor is trying to get involved by way of being an energy contractor for the AF. CE Energy Office response is the EUL contractor would come in and conduct a study costing \$1M dollars and the base would still not have any construction or RE power completed. The EUL contractor responded, yes. The cost and associated delay with the EUL process was a significant factor in the base's decision not to use EUL for this effort.

Are there other related documents that must be considered when proceeding with a PV generation project?

[MP] In reviewing the paper work, another key point has to do with the local power company. This is another item that should be addressed earlier in the process. They have to bring their proposed changes to the existing standby

agreement. You have to have a standby agreement for every case where you are buying power. The base has to have standby power in case the PV array goes down and the local utility company has to provide the base power. The standby agreement takes into consideration the rate charged for backup capacity.

[GS] The AF really prides itself in being on the cutting edge of everything. It is really attractive to us as a culture to say we can do this thing, the place is out there, and the stars are aligning. How do we do it? LtCol White, from ACC/A7, and some folks from AFCESA, can into 99th CONS, and started talking with some contracting officers. The contracting officers brought me into the discussion. They wanted to do this right away. They were afraid this would be an 18 month effort. I could tell this was very significant, not in terms of contracting, but in terms of a project, how it moved, how it processed, and how it went. The first thing I did was ask them, what is your requirement? Three people spoke up and all had different requirements. I want sun power. I want to save money. I want to do this or that. The biggest part was defining what it is they wanted. You go through a vetting process, asking probing questions in an effort to define the need and obtain actionable requirements. You really have to do that Socrates way of asking what is it that you have to have. It centers on defining the requirement, and who is the customer. Who will speak for the customer?

E. SUMMARY

The information referenced in this section was obtained from several different agencies, offices and key personnel. In the next chapter, these data are analyzed with respect to achieving the desired end state, inefficiencies discussed and redundant and non-value added steps identified.

The area of research related to establishing RE at Nellis AFB has yielded a substantial amount of information. There is a tremendous wave of interest in RE worldwide. Policies, processes and procedures for procuring RE are in continuous evolution, and may be significantly impacted by new legislation, international treaties, guidance and strategic goals.

Each of the interview participants provided their unique view on the PV array contracting and development process. Their perspectives have provided valuable insight into the entire process, and also highlighted several areas that will benefit from the analysis of our next chapter.

It is important to understand the dynamic nature of energy requirements and RE technology. While the information presented in this project reflects the most current available, every RE project is likely to be unique and require a different set of decision criteria. The most recent version of the documents referenced should be easily obtainable from the internet using common search engines.

IV. ANALYSIS OF DATA

A. INTRODUCTION

The U.S. has been continually shaping Energy Act legislation. Congress has set very modest energy goals for the nation. The implementation and enforcement strategies of national objectives continue to evolve, but are relatively immature. The individual states have the responsibility to meet the Energy Act requirements, and the results have been mixed. Only a dozen states have set an enforceable Renewable Portfolio Standard (RPS). Three states have set goals that are currently non-enforceable. The remaining states have yet to set any sort of portfolio standard.

The State of Nevada's **NRS 704.7811** defines a Renewable Energy (RE) as being comprised of: (a) Biomass; (b) Geothermal energy; (c) Solar energy; (d) Waterpower; and (e) Wind. The term does not include coal, natural gas, oil, propane or any other fossil fuel, or nuclear energy.

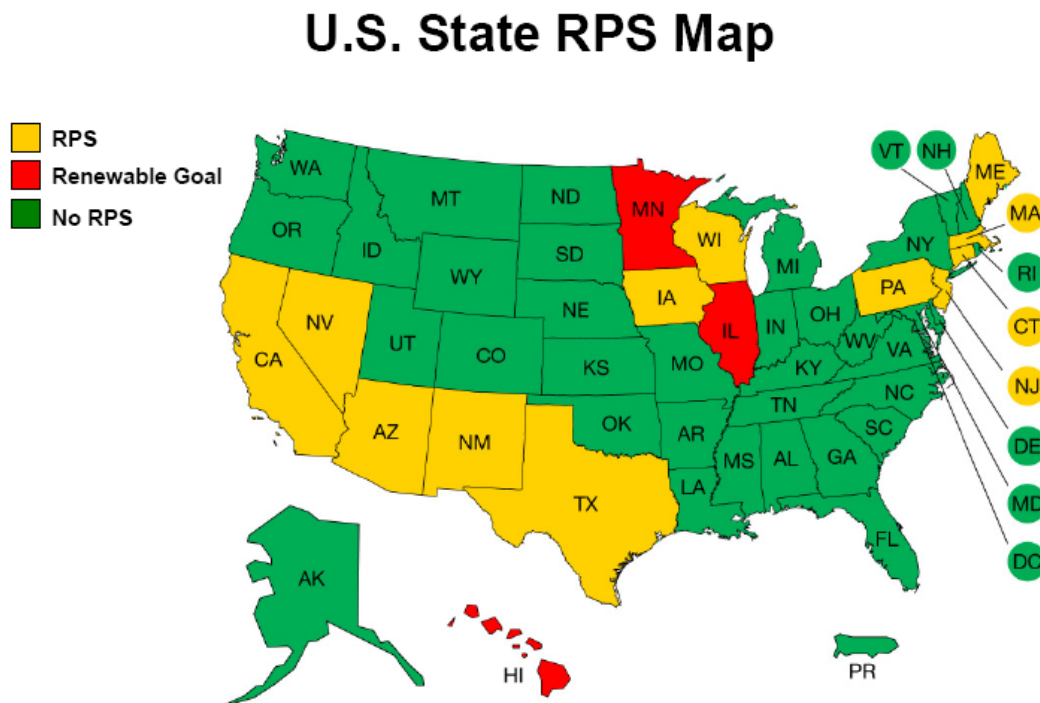


Figure 7. Renewable Energy Policy Project, Renewable Portfolio Standard (RPS) Map, 2007

The State of Nevada has been proactive in promoting the use of renewable energy. The Nevada State legislature's update to their 2003 Renewable Portfolio Standard resulted in one of the most aggressive renewable energy goals in the Nation. This binding legislation outlined the states renewable energy generation goals for the future. The RPS requires state utilities to obtain a set percentage of their energy generation from the sources listed in the RPS. Failure to meet the RPS targets will result in state assessed fines until portfolio goals are met. Nevada is using Renewable Energy Credits to manage RPS.

The State of Nevada defines a Renewable Energy Credit (REC) as the unit of credit represented by the production of one kilowatt-hour (kWh) of electrical generation by a renewable energy system and consumed by an end-use customer in the state of Nevada.

The State of Nevada wanted to ensure the RPS included an array of RE generation modalities. In order to assure a certain level of resource diversity among different renewable energy technologies, policy makers could have used: (1) specific resource bands or tiers, (2) credit multipliers, or (3) complementary policy approaches.⁵⁸ These tools were critical to the state's ability to influence the industry into developing the less profitable technologies, such as PV. In order to make PV more profitable for commercial ventures, Nevada used credit multipliers in addition to a set percentage in the RPS. The credit multiplier effectively tripled the value of each PV REC, attracting further PV investing and construction.

B. ANALYSIS OF DATA

1. Political Environment

a. Government Perspective

Most of the energy we use comes from fossil fuels. The problem is that fossil fuels are running out and U.S. Government leadership understands this. It would

⁵⁸ Fields, R. (2007, January 30). *Annual Report to the Nevada Legislature and the Governor of the State of Nevada, Volume II, Appendix*. Retrieved October 18, 2007, from the World Wide Web: http://www.digitalcandidate.com/upload/nreETF_f_470_ix.pdf.

take millions of years to completely restore the fossil fuels that we have used in just a few thousand years. For all practical purposes, fossil fuels are non-renewable sources of energy.

Renewable energy comes in as a resolution for this global issue. It is any natural source that can replenish itself naturally over a short amount of time. Renewable energy sources are wonderful options because they are practically limitless. Many renewable energy sources do not pollute air and water the ways that burning fossil fuels does, and are therefore supported by politicians in the United States who recognize the need to switch to renewable energy.

The DoD is the largest energy consuming department in the Government, the nation's single largest energy user, and has the ability and financial resources to begin converting its operations from fossil fuels to renewable energy. Political leaders who support DoD's RE efforts to convert to RE could benefit from the resulting positive press coverage. DoD already has a pro-renewable energy position which was helped to be sparked by the Energy Policy Act of 2005 that states the Federal facilities provisions such as energy reduction goals of 20% by FY 2015, energy efficient buildings, purchasing 3% renewable energy in 2007-09, 5% in 2010-12, and 7.5% in 2013 and beyond.

Mr. Salton, at the Contracting Squadron, discussed where the United States receives a majority of its energy. Even though, there is much debate on whether getting energy cheaper is more important than being independent of foreign energy resources, having renewable energy resources is helpful. In the state of Nevada, there is plenty of wind and sun than can be utilized as a source of renewable energy. Mr. Salton additionally commented that the Senate majority leader is from Nevada, which helps with voting on the future of Nevada's renewable energy.

The Air Force wants to lead the way in procuring power from renewable energy sources. The political environment was just right for considering Nevada and Nellis AFB for renewable energy. The environmental, political, and leadership conditions were superb for pursuing the RE project.

What catalyzed the Nellis AFB solar project was the DoD report done by Pacific Northwest Lab in late 2003. This report helped Nellis AFB become identified as a strong candidate for solar resources. As a result, ACC/A7 received a call from PowerLight, a private developer that was interested in using Nellis AFB land to put in a 23 MW PV solar array.

The political environment supported renewable energy legislation for Nevada. Furthermore, Nellis AFB wanted initiate a renewable energy project because it would be cost effective to the base. The Senator wanted something for Nevada. Additionally, there were some people who did not have a profit motive but instead may be focused on doing something for the environment. Instead, this project originated from Federal Energy Act requirements. The Air Force was trying to scope out opportunities, and wanted to take advantage of this opportunity when it materialized.

The Air Force has a strategy to pursue renewable energy, and is currently revamping a holistic strategy for energy that includes development and use of RE. The strategy is based on what the AF is calling the four pillars. In review, these include (1.) To improve current infrastructure, to do retrofits, buy better lighting and more efficient chillers (air conditioners), (2.) improve future infrastructure; with new design standards, such as LEAD principles, (3.) procure Renewable Energy, (4.) manage utility costs, by getting the best rates the AF can and to lower our costs for things like standby charges, demand charges, late fees, and everything else. The AF would litigate rate increases and manage utility costs. This four pillar strategy is currently being developed and helped create the environment needed for the Nellis AFB RE project.

There were not any specific parts of the Federal Energy Act that directly affected decision-making during the project's contracting effort, but understanding how it may affect the power generation business was considered. The Federal Energy Act focuses on the financing side and it provides the incentives that will induce a company such as PowerLight to initiate a project like this and venture into sun power alternatives to energy production.

This project was not undertaken to help meet Davis-Bacon requirements because it is not a Government MILCON project. It is simply Nellis AFB purchasing utilities. Under the terms of this project, Nellis AFB acts as a landlord to the contractor who leased the land.

b. Industry Perspective

Regarding the contractor SunPower, it is in the Scientific and Technical Instruments industry, whose direct competitors are BP Solar International Inc., Mitsubishi Power Systems Americas, Inc., and Sharp Corporation LTD ADR. As the public begins to recognize and understand the focus on global climate change and oil depletion, green energy is becoming increasingly popular and attracting investors. Currently, SunPower is at the forefront of this new green revolution and is spending millions of dollars expanding factories to keep up with demand for silicon-based solar cells, while reducing the threat of competition.⁵⁹ Jan Soderstrom, who served as the company's acting CMO and now consults with the company says, "We are limited primarily by the production of raw materials. We have to compete with other industries for silicon, but that situation should be alleviated somewhat in 2008."⁶⁰ To reduce this competitive threat, SunPower became its own supplier by purchasing PowerLight.

SunPower says they make the world's most efficient solar cells as measured by the percentage of sunlight captured and converted into electricity. Their advancement of solar technology keeps their competitive edge and market share within the solar energy. Typical solar cells convert about 14-16 percent of sunlight into electricity, but SunPower cells achieve efficiencies in the 20 to 22 percent range. It claims its solar cells and modules generate up to 50% more power per unit area than conventional solar technologies. "That is our point of differentiation," Soderstrom says,

⁵⁹ CMO Council. (April 2007). Retrieved November 8, 2007, from the World Wide Web: <http://www.cmocouncil.org/resources/marketingmagnified/2007/april.asp>.

⁶⁰ Ibid.

“driven by our intelligent engineering. We also differentiate on the aesthetic appeal of our products, great design.”⁶¹ SunPower’s production of innovative solar technology differentiates its products from the competition.

Since, SunPower competes against major companies like Sharp and BP, muscling its way past BP in the United States, to claim the number two position comes from brand recognition. “I was brought in three years ago to help create a brand for SunPower and develop a sustainable, long-term positioning,” Soderstrom explains. “The company had been in business for over 20 years but wanted to move aggressively into the consumer market.”⁶²

SunPower markets to both business-to-business and consumer markets and is growing at a double-digit rate, restrained only by production capabilities. Currently 70% of its U.S. business is in California, where sunshine and subsidies help fuel the renewable energy market. “Most of our customers are looking for a system that will provide them with a lower tier electricity rate and expect that a solar source will supply 70 to 80 percent of their needs,” Soderstrom explains. “For a 3,000 square foot house the average price would be around \$30,000, but with state and Federal subsidies, the price drops to \$20,000.”⁶³

SunPower is targeting the consumer domestic market primarily in those states that have abundant sunshine and favorable subsidies like Nellis AFB. Marketing is aimed at generating quality potential customers by determining the prospect’s readiness for solar, including the amount of available sunshine, an unobstructed view of sun, and other weather related factors. Once a prospect is qualified, potential customers are sent to a dealer in the area and the dealer provides an estimate. To make this an even more attractive business venture, SunPower offers financing programs.⁶⁴

⁶¹ CMO Council. (April 2007). Retrieved November 8, 2007, from the World Wide Web: <http://www.cmocouncil.org/resources/marketingmagnified/2007/april.asp>.

⁶² Ibid.

⁶³ Ibid.

⁶⁴ Ibid.

To move beyond its component-level business-to-business markets SunPower acquired PowerLight, and the two companies approached \$1 billion in revenue, split approximately 70% business-to-business and 30% consumer installations. The PowerLight addition helped SunPower enter into both the commercial business and Government alternative energy markets, which leverages PowerLight's installation capabilities.⁶⁵

Overall, SunPower's advantages to the Nellis project were that SunPower was the low bidder to verify it did not have contingencies; SunPower had a firm offer no matter what NPC came back with on their price. Nellis ended up with a price of \$0.0222 for the power. This represented the lowest present value. SunPower was a company with a large amount of revenue and experience working with the Government. These were important factors considering the 20 year length of the contract.

2. Leadership Buy-In

In order to get leadership to buy-in for the Nellis AFB solar energy project it took leadership buy-in from all levels of: Air Combat Command, Nellis Civil Engineering, and SunPower Corporation. Specifically, for the Air Force, the Nellis AFB Photovoltaic Power Project started in early 2004, when PowerLight, a private developer, contacted Nellis AFB with a proposal to place a 23 MW PV system on Nellis AFB.

First, PowerLight was referred up CE's chain-of-command to Mr. Steve Dumont, HQ ACC Mission Support Civil Engineering Office (ACC/A7OE). The 99 CES Energy Office recognized that under the current decision making hierarchy, the approval for such an ambitious and novel project resided with HQ ACC in Langley, Virginia.

Mr. Dumont worked power purchase agreements. When he received the message from PowerLight, he already knew the cost parity between PV and traditional energy generation was cost prohibitive. At the time, PV cost \$0.27 per kW hour, versus only \$0.075 per kW hour from Nevada Power Company. The initial reaction was the unsolicited proposal would not be an economically feasible solution for the AF.

⁶⁵ CMO Council. (April 2007). Retrieved November 8, 2007, from the World Wide Web: <http://www.cmocouncil.org/resources/marketingmagnified/2007/april.asp>.

This situation highlights the disconnect of centralized decision making; but getting HQ ACC involved at the very beginning was a critical element in awarding the contract expeditiously. Initially, Mr. Dumont was unaware of Nevada's aggressive renewable energy initiatives. At the very least, his skepticism delayed the proposal evaluation by two weeks. He did not become engaged until he received a call from Mr. Al Day of Air Force Civil Engineer Support Agency's (AFCESA) Civil Engineering Squadron. PowerLight did get through to Mr. Day and explained how they could make such an ambitious project economically feasible. ACC was interested and immediately began a quick economic analysis of the proposed plan, providing more leadership buy-in to the project.

Second, HQ ACC had to ensure the leadership at Nellis AFB embraced the solar energy project. Steve Dumont and personnel at ACC/A7 knew it would require a champion at the base to take the initiative. To begin this process, HQ ACC contacted the 99th Contracting Squadron (CONS), Nellis AFB. Personnel from HQ ACC Mission Support Energy Office and AFCESA traveled to 99 CONS, Nellis AFB, to start the AF contracting process at the base level and verify their leadership was ready to provide the necessary support for such an ambitious power project.

Third, SunPower purchased PowerLight Corporation in January 2007, a key supplier of solar power systems that designs, deploys and operates hundreds of large scale solar systems around the world.⁶⁶ SunPower's acquisition of PowerLight occurred just six months after Nellis AFB awarded a solar energy project to PowerLight in July 2006. By integrating processes and technologies across the value chain, SunPower plans to reduce the installed cost of a solar system by 50% before 2012 with its purchase of PowerLight.⁶⁷ Additionally, SunPower believes solar systems will produce power that can compete with retail electric rates and become a mainstream energy resource.⁶⁸ Ultimately, SunPower's interest in building a large-scale solar energy project at Nellis

⁶⁶ East Bay Business Times, "PowerLight to Buy SunPower for \$265 Million." Retrieved November 16, 2007, from the World Wide Web, <http://eastbay.bizjournals.com/eastbay/stories/2006/11/13/daily24.html>.

⁶⁷ SunPower website History section.

⁶⁸ SunPower website About Us/ History section.

AFB originates from its special business incentives gained for selling PV technology, its accelerated growth in the solar energy market, and its ability to reduce the threat of competition.

3. SunPower Growth Strategy

According to SunPower CEO Tom Werner, SunPower's growth strategy is to strengthen its global customer base. In order to achieve this, SunPower built a greater supply-chain of opportunities through strategic business investments, the largest of which was purchasing PowerLight Corporation, originally SunPower's main supplier of solar panels.

After SunPower agreed to purchase PowerLight, Tom Werner, CEO of SunPower said, "PowerLight presents us with a downstream of investment opportunity that will accelerate SunPower's revenue growth while meeting the long-term financial model. We intend to build on our strong market positions and duplicate our success in other emerging markets."⁶⁹

SunPower believed the acquisition would enable it to develop the next generation of solar products and solutions that will accelerate solar system cost reductions to compete with retail electric rates without incentives and simplify and improve customer experience. The total consideration for the transaction was \$334.4 million, consisting of \$120.7 million in cash and \$213.7 million in common stock and related acquisition costs.⁷⁰ The acquisition of PowerLight has been lucrative for SunPower. As of November 23, 2007 SunPower's 52-week stock price range has increased from \$33.30 per share to \$164.49 per share.

⁶⁹ SunPower website, "SunPower Signs Agreement to Acquire PowerLight Corporation", statement by CEO Tom Werner. Retrieved November 16, 2007, from the World Wide Web, <http://investors.sunpowercorp.com/releasedetail.cfm?ReleaseID=218726>.

⁷⁰ SunPower Corporation. (November 15, 2006).

It is apparent that the solar industry is extremely competitive. A financially strong company, with experience and resources to develop the Nellis AFB solar project is beneficial. The SunPower strategy benefits Nellis AFB because the contract is under a 20 year PPA. A steady supply of replacement solar panels and equipment over this timeframe is needed.



Figure 8. SunPower Corporation Stock Price. (From: Public, NASDAQ: SPWR). http://bigcharts.marketwatch.com/quickchart/quickchart.asp?symbol=spwr&sid=0&o_symbol=spwr

4. Federal/State Incentives/Disincentives

First, ACC/A7 gathered information on Nellis AFB's energy use, current pricing and the PUC's tariff structure. The breakdown included the estimated value generated from selling the energy credits, the Nevada Power Company's rate structure for Nellis AFB, and a state tax incentive that equated to approximately \$0.02 per kWh. This quick analysis showed such a project might provide a benefit to the AF. Next, ACC/A7 began a detailed analysis of PowerLight's plan.

In order to be able to compare the proposed plan to the current situation, ACC/A7 recognized the advantages of building a model that represented the costs associated with Nellis AFB's power consumption. This was a complex task. The cost per kilowatt hour depends on several factors; including time of year, time of day, total usage, applicable tariffs, additional fees and charges, whether this usage occurs during peak, mid-peak, or off-peak periods. Given the fact the rate may change several times throughout the day, it was important to capture historical usage.

It was critical for ACC/A7 to use the most recent load data for an entire year, in the form of 15 minute intervals. Once the model was constructed, it was validated against the actual billing statements. The model was then fine-tuned until it matched billing records. Next, ACC/A7 substituted the expected solar array output in the validated model. The model indicated the proposed solar array would save the base an estimated \$1M per year. HQ ACC completed the model and the results indicated the proposed solar project would benefit both the AF and Nellis AFB.

This model did not account for the variables associated with energy usage and rates. The variables include actual usage, and the PUC approved rates and tariff structure. Power usage has the potential to either decrease, as a result of greater than anticipated conservation efforts, or increase, as the result of base expansion or other usage factors. Significant changes in usage will place the base into new rate tiers.

Second, Nevada Power Company is expected to provide standby power to meet the bases power needs should there be a problem with the solar array. Naturally, this standby power generation capacity comes with a cost. The power company would pass this cost on to their customer base. This would be the same as having an unplanned loss in production, yet still have to maintain the entire factory, and as a result, finding it necessary to distribute the fixed overhead cost over the fewer finished products. Would most of the power customers have to pay for the standby capacity? How much will this impact the amount the base pays for the 70% of power bought from NPC?

Fortunately, the new system was designed to minimize the chance of a large scale failure. The use of a complete distributed generation system means that if a row of panels

fail, it does not affect the rest of the array. This design mitigates the need for all but a very small portion of standby power. Furthermore, the solar array is on site and feeds directly into the base's power distribution grid. This minimizes the possibility of failure, as the generation facility is better protected because of its location, and less susceptible to risks from unpredictable off-base events.

The model included an amount for the standby rate for the economic analysis. This was a best guess and prudent move, since the actual rate could not be determined in the early stages. The AF is currently in negotiations for the new rate and has found new information that directly impacts this issue. Nevada State Legislature's Assembly Bill No. 178, Revises provisions relating to net metering and energy (BDR 58-1054), February 26, 2007, states:

3. If the net metering system of a customer-generator who accepts the offer of a utility for net metering has a capacity of more than 100 kilowatts, the utility:

(c) Shall not charge the customer-generator any standby charge.

Throughout the entire project development and numerous discussions with NPC, there was no disclosure of this little known fact; that in certain situations the benefactor of an installed solar array may not be assessed any standby charge. The results of the current negotiations are expected to be very favorable for Nellis AFB as standby charges may be eliminated under the Nevada State law. This initial concern about an added cost may have turned into greater than anticipated savings for Nellis AFB.

Shortly after the contract was awarded, Nellis AFB benefited from a rate reduction from Nevada Power Company. This resulted in slightly smaller potential savings from the project, as the rate negotiated for the solar power will remain fixed for 20 years. The other concern related to a possible change to Nellis AFB's standby utility rate with NPC. It could be reasoned the standby rate for Nellis AFB would increase significantly since the solar array would provide 30% of the base's power previously provided by NPC.

SunPower's incentives for developing the solar energy system at Nellis AFB come from its ability to buy and sell PV technology to the Air Force as well as to the State of Nevada.⁷¹ First, SunPower is attracted by a 20-year indefinite term utility contract with Nellis AFB. Although SunPower will only collect some its profits after completing the Nellis AFB project, SunPower will realize immediate cost savings through its fixed contract, which allows it to achieve higher profits as it develops more efficient solar energy panels.⁷² For instance, SunPower has already replaced some of its panels with Power Tracker panels that capture 30 percent more energy, which offsets upfront costs.⁷³ Additionally, SunPower's development of a lower-cost solar system at Nellis AFB over the next five years has potential to increase its overall profits.

SunPower is seeking profits (through MMA Renewable Ventures management) by selling PV RECs to Nevada Power. Since, the State of Nevada has the most aggressive renewable energy laws in the United States, the State's use of credit multipliers, in addition to a set percentage in the Renewable Portfolio Standard (RPS), is an incentive for SunPower (MMA Renewable Ventures). Although, the financial particulars of these REC sales are confidential between all parties, the fact that the State of Nevada triples the credit multiplier for PV technology is financially more beneficial.

5. Contracting Vehicles

This section highlights and analyzes several key points based on discussions with Mr. Salton and documents provided which address the Nellis AFB contracting process. The four major analysis points are: (1) requirements generation is not an easy or quick process; (2) defining requirements for a complex necessity such as installing a PV farm call for a team approach which includes Government and contractor personnel; (3) an Air Force base must understand its external environment; and (4) a well-written solicitation is a reflection of a total team effort.

⁷¹ MMA Renewable Ventures (financier) is the third party that manages and sells energy and RECs.

⁷² SunPower Corporation Case Study.

⁷³ Ibid.

a. Generating Requirements

The first key point is requirements generation is not an easy or quick process, as discovered when Mr. Salton revealed that requirements generation for this project was not an overnight process. It was the result of significant time and effort from many organizations. It was important for the 99th Contracting Squadron to be able to define the requirements as clearly as possible. Achieving clearly defined requirements was a result of personnel from ACC/A7, AFCESA, 99 CES, and 99 CONS Contracting Officers effectively coordinating their priorities in a collaborative effort. Mr. Salton indicated it was his organization's priority to improve organizational understanding of how to define a requirement and work as a team. In order for this to work, the 99th CS had leadership personnel go through a vetting process which included asking probing questions in an effort to define the need, and obtain actionable requirements. Defining the requirement and being able to know who the customer is and who will speak for the customer is very important.

b. Defining Requirements

The second key point is defining requirements is a team effort. The key players had an ambitious work schedule and it was important for Mr. Salton to push them through the requirements defining process and writing the Statement of Work (SOW). In the beginning, there was uncertainty as to the deliverable. The players sometimes confronted a problem of not having enough information as they were working through certain phases of the requirements definition process. When faced with this situation, it was beneficial for them to halt the process, contact an outside source, such as a subject matter expert, via telephone or linking to a VTC. Being able to capturing critical information at that point in time is integral to helping the process move forward. Mr. Salton found it very important to get everybody together, on a computer, and formulating the Statement of Work.

A significant challenge in defining the scope and limitations of the proposed project and meeting the goal of having an actionable product for RFP preparation in a short amount of time was that there was no template for it. Mr. Salton and his organization had to create the template. Further complicating the definition process was the fact that this is a contract with a lease feature.

As Mr. Salton indicated, getting to the point of administering the contract may not be as challenging as the political aspect. The contractor would be investing heavily in the project, installing it, and then starting to earn money for the investors. Mr. Salton gave great advice when he said the contracting officer needs to stay out of the political aspect because contracting officer duties are to be fair and impartial, and not be involved in political matters.

c. Understand an Installation's Circumstances

The third key point is that a DoD installation needs to understand its own peculiar circumstances. Mr. Salton was able to successfully coordinate all of the players and share expectations. Expectations were shared in terms of product, process, and timeframe. Nellis AFB understood its own peculiar circumstances, such as the state and county regulations, and the environmental considerations that may have an impact on executing the project with expected results.

Mr. Salton did well in helping to flush out issues such as describing what exactly this project was going to achieve in the end. Defining what Nellis would provide and the restrictions on the leased property were key. The reason is both contracting and real estate components to consider for this venture and real estate laws are much less flexible, according to Mr. Salton.

d. Solicitations Take a Team Effort

The fourth key point is a solicitation reflects the overall goals of the Government team in defining the requirements. The result of this particular effort was the 99th Contracting Squadron issuing Solicitation number FA4861-06-R-B501, issued April 18, 2006 as a negotiated (RFP) type of solicitation. This solicitation was very well written

and had many well defined requirements. For example, interested contractors were required to submit proposals at or before 1400 hours on May 18, 2006 to be considered responsive. The Government provided a clear scope and purpose in the solicitation stating that it is requesting proposals for the purpose of contracting with a qualified utility provider to furnish all labor, materials, tools, equipment, and incidentals necessary to supply and deliver renewable (solar power) utility service to Nellis AFB from a contractor owned PV array. The Government wanted the contractor to be responsible for any ancillary and/or incidental services, including scheduling and coordination, required to deliver electricity to the delivery point at Nellis AFB.

The Government intended this acquisition of the renewable utility service to be governed by the FAR and its supplements. It was the Government's intention to award an indefinite term electric utility contract that will result in overall lower unit cost for electric utility service than what Nellis AFB is currently purchasing from Nevada Power Company Rate Schedule LGS-X-T. If all the proposals received were for more than the cost of service from Nevada Power Company, the Government reserved the option to not award the contract because this would not be beneficial to the Government and its desire to save taxpayer money.

The Government decided to add the reservation that a PV array produces both renewable energy (solar power) measured in Kilowatt-hours (kWh) and renewable energy credits (REC's). Nellis AFB was aware that the proposer must sell both outputs of the PV array, i.e. kWh and REC's, to have a viable project; however, the Government was only interested in the acquisition of kWh from the solar array and was not seeking to purchase the REC's.

For contract award purposes, the government had two options. It could award the contract 'Best Value' or 'Lowest Price Technically Acceptable' (LPTA). In this case, the Government desired to minimize costs and decided the selection of a contractor would be based on a LPTA source selection process consistent with the evaluation factors described in Section M of the solicitation, "Evaluation Factors for Award." The Government intended to negotiate with all responsible and responsive offerors who submit proposals within the competitive range. FAR 15.306 required the

Procuring Contracting Officer (PCO) to establish a competitive range comprised of all technically acceptable proposals. This competitive range may further be limited to the greatest number of proposals that will permit an efficient competition and those offerors outside the competitive range would not be allowed to continue participating in the procurement. Therefore, offerors were encouraged to submit their best offer as their initial offer.

The Government wanted the utility service to comply with all applicable Federal, state, interstate, and local laws and regulations, as they may be amended from time to time, including those requirements relating to health, safety, and the environment issues. The Government wanted the contractor to determine the optimum PV array size for Nellis AFB based on historic meter data, sun's angle of declination, proposed PV panel specifications, terrain, and available land. The Government's preliminary calculations showed the PV array size would be in the range of 15MW (DC) to 20MW (DC). The PV array would need to be designed so that Nellis AFB would use all the power produced. The Government intended to have the contractor complete all construction and have an operational PV array within 24 months of contract award. The contractor would be permitted to bring on partial loads as PV modules are completed and Nellis AFB would acquire the power as it comes on line. The contractor would need to be able to explain how excess power, i.e. when the PV output is greater than base demand, would be consumed and billed.

The PV array installed under this contract needed to meet certain criteria. It would be the Government's responsibility to provide approximately 140 acres in the vicinity of Range Road and the closed landfill for the construction of the PV array. This land would be conveyed via a separate ground lease. The 99th Contracting Squadron did provide the lease array template on May 23, 2006, which outlined recitals, leased premises, and a total of 33 conditions. Examples of some of these conditions are term and delivery of possession, easement and rights-of-way, condition of leased premises, and use of leased premises. This lease acknowledges that the Air Force is required under the Energy Policy Act of 2005 to purchase energy from renewable sources, such as solar technology, starting in 2007.

As an onsite generator of solar power, the contractor will be operating its solar array in parallel with the electricity supplied to Nellis AFB by Nevada Power Company from outside the base. The contractor would be required to provide all inverters, transformers, switchgear, wiring, and protective devices to connect to the base electrical distribution system. To ensure this was completed, the Government would require offerors to submit evidence with their proposals that a request to Nevada Power Company for an Interconnect Agreement has been made. No contract could be awarded until an Interconnect Agreement with Nevada Power Company is secured.

The Government was concerned about security and requested that the PV array be protected on all sides to prevent unauthorized persons from entering the area, tampering with the array, and to protect against the danger of electric shock. As a minimum, the height of the fence would need to be six feet and Nellis AFB would need to approve the type of fence. The contractor would need to take action or modifications necessary to assure the PV array is compatible with Nellis AFB electrical distribution system. Any proposed modifications that would affect the Nellis AFB electrical distribution system would require the approval of Nellis AFB. The PV array should not have any adverse affects on the Nellis AFB electrical distribution system, or on loading, power factor, voltage levels, transformers, structural integrity, protection device coordination, or the operation of any base electrical equipment.

The Government wanted the PV array to produce power that is inverted and transformed to the 12.47 KV three-phase base electrical distribution system. The power supplied to Nellis AFB would need to be free from power quality issues such as surge, under voltage, overvoltage, harmonics, voltage sag, or voltage swell. In the event of a power outage at Nellis AFB substation or from the Nevada Power Company substation, the PV array would need to automatically stop producing power. The contractor would need to use the 2002 National Electric Code (NEC), National Electric Safety Code, and other applicable Federal, state, and industry standards as applied to this project. All work performed by the contractor would need to be guided by these

specifications in conjunction with the statement of work. Nellis AFB reserved the right to reschedule to proposer's work requiring service interruption at any time if such interruption might adversely affect Nellis AFB's missions and operations.

These are all strong examples of clear requirements and the effort of a diverse group to understand what is needed, who the customer is, and what exactly needs to be accomplished by all parties subject to the contract. A lesson learned from this process was that a competitive RFP solicitation was needed, ensuring the least cost and minimization of potential for protests. Further, it appears that an indefinite term utility contract needs to be approved and awarded at base level. The long term lease provides stability for investors. Having a small dedicated core team streamlines RFP development and evaluation process. It is clear that secure leadership support up front is essential and all stakeholders need to be involved from the start such as real property, contracting, legal, engineering, and security. It seems necessary to include the model interconnect agreement in the RFP and know jurisdiction of site for tax purposes. Clearly ranking proposals in order and document seems helpful along with documenting non-conforming proposals to provide support in case of protests. Formalizing a business case for leadership and reviewing proposals for stated or implied contingencies and ensuring they are eliminated is important. Securing funding for EA, EBS, legal survey, and land appraisal before the project moves forward is a solid step. An organization should clearly define calculations for "low bid" in the RFP and base calculations on the life cycle cost. Establishing primary and alternate representatives for all stakeholders, ensuring functional experts are readily available, and educating construction inspectors about unique requirements for contract vehicle use are important.

6. Application to Other Programs

It is possible to develop a similar model for RE, in general, to be used at other installations. Mr. Dumont rationalized that it really depends on how each state's PUC wants to push REs and how they want to structure their portfolio requirements. For example, Davis-Monthan AFB's PUC is closer to Nellis AFB's model than to California's RE model.

In order to develop a similar model for RE, there is a significant level of detail needed for computing more accurate costs and the model must be customized to each location due to each base having their own profiles. Each base will have a customized rate structure and tailored tariff structure and schedule. The model would need to have the related tariff structure added into it. It is not possible to just change the numbers in the formulas as the application is also likely to be different for each power company.

No other southwestern bases have built or contracted solar power generation facilities yet. For example Edwards, Creech, Luke, and Davis-Monthan have not done any solar to this point. Nellis AFB is leading the way with PV Solar and what has been accomplished at Nellis AFB may be applied elsewhere, such as Edwards, Creech, Luke, and Davis Monthan Air Force Bases, which have not initiated solar RE projects to this point.

ACC/A7 is not currently working on models for any other bases but is considering a potential solid waste generation project at Davis-Monthan; but, organization reaches a point of modeling this location. This would potentially work similar to the Nellis AFB model as the AF would lease the land and the contractor would own and operate the facility, then sell power to the base at a discount. There is currently a strong green contingent opposing the project as the concept of burning trash seems counter to environmental conservation. Burning trash to produce power is not considered a form of renewable energy by the Federal Government.

Net metering laws can affect the project. For example, Michelle Price referenced the Oregon Army National Guard who is considering a project, but the plant will be located away from the using installations. Oregon allows for net metering and the PV plant output and usage would be tracked. Because of state laws, the Guard will be able to utilize off-site power generation and be able to realize the full benefits from the negotiated rate.

There are some recommendations for projects dealing with solar energy to make it more reproducible but circumstances are likely to be significant.. In the Nellis case, the AF was fortunate in its timing. If the AF had attempted to complete the PPA three

months later, the project may not have happened because there were many entities interested in selling RECs to NPC, it is likely that somebody else would have sold them and NPC would not have had to buy anymore, RECs.

Individual state laws, regulations, and incentives appear to be a significant evaluation factor. Examining what is available and what is going to make the market favorable for RE projects is a significant factor. Once identified, it appears important to time the project to incentives. When analysis indicates projects are likely to be economical, establishing a core team of four to eight people to execute quickly appears to be a key to success. This team will coordinate actions, approvals, and requirements within a limited timeline, so forming a small high functioning team with strong leadership support is considered essential.

There are some key components that are apparent for a successful RE project. Barem's theorem states to make a project work there must be three things: (1) Economics, (2) Engineering, and (3) Politics. In this case, politics was the legal component. The AF had a utilities lawyer on its team who proved invaluable in interpreting the myriad of laws, rules, and regulations to guide the team in successful decision-making. The AF had a contracting person on the team, because without a contracting person, ACC/A7 would have difficulty in formulating acceptable contract items like the SOW and other contract requirements. There was a specific process the AF wanted to use for its solicitation and selection and it was important to make the Contracting Officer part of the team and for this person to take ownership of that part. Lastly, the AF had a person working the economics portion, which resulted in the ACC/A7's model and validation process. The AF had all the critical components that were apparently necessary and analysis indicates that it would be important to consider an environmental person as part of the team. The Nellis project PV array does not have nearly the environmental impact that a windmill or waste energy plant would, so the environment expert was not as essential.

It is important to understand how a potential provider makes a profit and the business of solar power. The technology changes very fast and it is possible that the product being delivered today could be close to obsolete. Does a base know if it is buying

obsolete technology and does it matter? Is the contractor providing the base a product that requires intense maintenance? Will the contractor's maintenance cost rise faster than their revenue? How will all of this impact the base's ability to obtain sun power or other RE source?

Analysis shows that it is necessary to thoroughly define the requirement and describe what the project will achieve and what restrictions apply to the contracted parties. What is going to be provided? What kind of land will the base provide? What kind of rights are underneath the land? These questions are important because there are both contracting and real estate components to this venture.

This project was accelerated when compared to a traditional MILCON contract. This surprised many by how fast the construction is progressing as typical MILCON projects are measured in terms of years. It is financially beneficial for the contractor to finish quickly and begin to generate the necessary Return on Investment (ROI). The Government's concern is ensuring the contractor is following the terms and conditions in the contract, and also, benefits from the reduced cost energy provided.

Analysis of the Nellis program indicates that the following steps are necessary, a description on how a similar RE project should work including what changes should be made, what would have to be done differently, and potentially changing the timeline.

The EBS and legal survey needs to be done first. These should be done before the RFP goes out. A base needs to be able to tell the people who bid the exact boundaries of the land to be used. The issue with all the little pieces, such as where they come off the land and connect to the grid, must be covered in some language, but it will remain unknown until the contractor submits a design of where these connections may need to be made.

The RFP does not include a final design. It is a proposal and it will not be known where the contractor needs to connect until getting into the details of the proposal. The language should clearly state the areas must be identified where they will come off the

leased land to connect with the grid, and provide the contractor the process they will need to follow for that. In the case of Nellis AFB, many things were done perfectly, in how they evaluated the bids and moved forward.

A single point of contact and alternate for the contractor must be identified early in the project. In this case, the parties involved thought having a single POC would be a negative, but found the opposite to be true. Prior to the single POC, the contractor had worked directly with the Real Property Office, but the other parties did not have awareness of what was discussed. The same thing was happening with the Legal Office. Nobody knew all the pieces that were going on. Having a single POC ensures key people know and receive the right information.

It is critical to have a dedicated person for such a large project. A project of this scope really requires non-stop support. Early on, a base should identify as many key players as possible from a Real Property person at the base level to a legal representation at the base level to contracting at the base level and to base level CE. Then a base should get the AF Civil Engineer Support Agency Utilities Litigation Team involved early on, as they were in this project. The ACC/A7 Energy team and the command energy people need to be involved early on, because they are very experienced people in doing this type of work. Once all these players are together as a team, things become much easier.

Nellis AFB found that having two lawyers is good because if one is not available to review, the other would be. An example is with the interconnect agreement. Given the normal amount of time needed to staff such documents within the AF does not coincide with such an aggressive and fast paced project. A base may get a document on a Wednesday and need it signed by Friday at the Wing level. How do you get that done becomes the question. Having a lawyer identified who can get the document and can walk over to the Wing Commander's Office to get it signed can be a big help. The lawyer's accessibility to the Wing Commander is something most other personnel and CE personnel do not have. Ease of accessibility is necessary to keeping the procurement process moving forward.

The lease is signed at the AF level and all other documents are signed at the Wing/base level. The installation commander must be involved and understand his role and know that timeliness is a key ingredient in signing the required documentation. It is important to keep the installation commander informed and aware of the project's progress. It is important to have a project manager who is aware of everything. A construction inspector needs to be involved from the very beginning as well as an environmental inspector.

Because environmental issues, such as dust, water, and drainage, are documented in the lease, the contractor must follow all environmental regulations at the state and local levels, to include dust control issues. Some people at Nellis AFB were concerned the base would be cited for violations. It is not the base's land, but the contractor's leased land, and the contractor would be cited for any violations.

It is CE's role to ensure the base is not portrayed as an organization that is violating environmental rules. CE does not want construction stopped because of a violation of an environmental rule. It is a real possibility that the state environmental enforcement personnel could come out to the base and, if they find the contractor is not following the rules, shut down the operation until they can fully comply. CE does not want this to happen, so they provide their own level of internal oversight to tell the contractor that they identified potential issues that need immediate attention or the state will shut them down when they find it. CE's efforts at Nellis AFB have helped keep construction moving along without interruptions. Getting environmental involved was important.

It appears as soon as the contractor obtained the land lease, they were responsible for their conduct on it, to include adhering to EPA regulations during construction. Any violations would be assessed to the contractor and not the base. It is not a MILCON contract.

The contractor found there were several things they had not planned for and had to make changes. For example, they hired their own environmental specialist to assist with their construction. They hired an outside contractor to look at their water drainage.

Once identified, they took the necessary corrective and preemptive measures. Many of these measures are things CE would not have thought of doing, had they not contacted a base environmental inspector to go out and take a look.

Nellis AFB found that it is advantageous to have a construction inspector involved from the very beginning. They will need to coordinate activities, such as connecting to the base grid, and a significant number of power outages. It is critical to have someone involved who knows what is going on at all times. The initial impression might be a base would not need many people involved since the contractor is doing all the construction, but there is a very real need for the right personnel support to keep things moving and to mitigate issues. The AF followed as good of a process as possible for soliciting the project and getting that moved along quickly, and there doesn't seem to be anything there to correct.

CE mentioned they used the EUL framework for this renewable energy project, but did not abide by all its rules and requirements. There are changes to streamline the process with regards to EUL when pursuing a renewable energy project. For instance, a base can do any RE project using the Nellis AFB model. An EUL must go through the AF Real Property Association, because they manage the lands of the AF. A base has to go through them. They hired a contractor to do the EUL studies.

Nellis AFB felt they did not need another party to evaluate the land, since they already had contractors approach with unsolicited power proposals saying it was a good project. Nellis AFB already was convinced it was a good project ahead of time. The EUL program does have value when there is some land and no idea what to do with it. They will come in and evaluate it and provide recommendations for land use. Nellis AFB on the other hand, had land and knew what to do with it. Nellis AFB felt there was no need for further discussion or studies. It is possible to use the leasing authority within the AFB. The AF prides itself in being on the cutting edge of initiatives and the Nellis AFB project accomplished this.

C. SUMMARY

This section analyzed political environment, leadership buy-in, Federal/state incentives/disincentives, contracting vehicles, and application to other programs. It appears all these elements need to be present in order for the PV Array to provide Nellis AFB with reduced electrical demand and recurring annual utility cost savings with no out-of-pocket capital investment. Additionally, these six elements help place Nellis AFB at the forefront of federally-mandated energy conservation and renewable energy initiatives.

V. CONCLUSIONS AND RECOMMENDATIONS

A. INTRODUCTION

The AF Strategy includes the pursuit of RE through four main pillars: 1) Improve current infrastructure; 2) Improve future infrastructure; 3) Procure Renewable Energy; and 4) Manage utility costs. For RE projects to provide a benefit for the AF, they must be economically feasible.

The economic feasibility of RE is the result of state offered rebates and/or RECs. State rebates are often limited to \$1M. The larger RE projects can easily cost \$100M or more, so the small state rebate is an insignificant incentive towards new construction. However, RECs are adjustable to provide the needed incentive to attract business to RE generation. The State of Nevada created a comprehensive RPS; and then provided the necessary REC multiples to attract interest to historically cost prohibitive RE technologies, such as Solar Photovoltaic (PV).

The Air Force (ACC/A7 energy office) learned several lessons from the Nellis AFB project. Both speed and execution were the most visible lessons learned on their list. Private PV businesses were attracted to Nevada because of the increase in PV REC valuation, but NPC was only buying a limited number of the credits. Once NPC fulfills their RPS quota, they would not have a need to purchase additional credits until the quota was raised. This created a competitive environment for more than just the new RE suppliers. Nellis AFB was competing for benefits, in the form of lower utility costs, from the new RE power generation. The new RE power generators easily could have negotiated the sale of the power to other customers, including to NPC.

B. CONCLUSIONS

This paper provides a roadmap for other Air Force bases to utilize while implementing renewable energy initiatives in support of the Federal Energy Act requirements and DoD renewable energy goals. Other Air Force bases should carefully examine what the existing renewable energy requirements are at the Federal level, how these requirements are passed down to Air Force organizations, and how the Air Force

used contracting processes to make Nellis AFB North America's largest solar energy PV plant. In order to do this, an organization must be aware of how incentives, resources, and authority affect the base, the state, and the Contractor.

1. Understand the Incentives

Significant incentives provided motivation for Nellis AFB and SunPower to build the solar PV array. Specifically, incentives for using solar power at Nellis AFB came from cost savings using solar power rather than Nevada Power, a more expensive energy source, and from the State of Nevada's incentive program, since Nellis AFB was able to meet the Federal energy requirements. At the same time, SunPower gained entry into the government renewable energy market while also continuing to make money from selling RECs to Nevada Power.

2. Be Aware of the Existing Resources

Solar energy worked at Nellis AFB because of its geographical location. The State of Nevada had the right infrastructure for the implementation, sustainment and supportability of the PV plant. In addition, SunPower had proven solar energy technology being used globally to meet the Air Force renewable energy needs.

3. Ensure Proper Authority

Both Nellis AFB's 99th CONS and 99th CES dedicated personnel to administer appropriate contracting policies, ensuring that the contract was performance-based. The State used the Public Utility Commission of Nevada (PUCN) to approve the solar array as a power plant. Approval from the PUCN and performance-based contract gave SunPower the authority it needed too quickly construct the PV plant the way it wanted to within the specified parameters of the contract.

C. RECOMMENDATIONS

The researchers propose several recommendations to achieve sound and efficient RE power purchasing projects for each of the four primary stakeholders: the Major Command, Installation Civil Engineering Energy Office, Installation Contracting Agency, and the Contractor.

1. Major Command Mission Support

The primary office has the expertise to create an appropriate model to compare current and proposed installation energy configurations.

- Timeliness is of the essence. Each installation's energy office representative must remain vigilant to emerging RE opportunities and be willing to act quickly to capture them. They do this by conducting market research, market surveillance, and establishing or maintaining an open dialogue with their current energy suppliers. Once a possible opportunity is identified, the base must contact their MAJCOM's primary energy office to request a business case analysis of the proposed RE project in order to determine the economic feasibility.

2. Installations Civil Engineering Energy Office

The primary objective in working closely with CE is to facilitate the entire process. Speed in execution is critical to realizing the estimated cost savings for both the AF and the contractor. Undue delays, at the fault of the AF, could result in the contractor requesting economic considerations. Once an opportunity is identified, the installation's CE office should take the following actions:

- The installation's Real Property Office should immediately order an Environmental Baseline Survey, land appraisal, and land survey. Even if the deal falls through, these documents may be retained for future use. The SAF pays for the legal appraisal, and the installation pays for the surveys.
- Designate a POC and alternate POC to the dedicated core project team. Having a single POC ensures key personnel have accurate and updated information.
- Designate a POC and alternate POC for contractor support during the construction phase. Due to the accelerated nature of the construction schedule, active participation by the CE office is necessary to support the contractor's needs. This person will also provide coordination with the

appropriate local, state, and commercial agencies. This person will also be required to provide guidance for issues not addressed in the original contract.

- Ensure all core project team members understand the initiative's background. This will prove invaluable to making informed and timely decisions.
- Coordinate with the AF Real Property office. The land lease agreement has to be signed at the Air Staff level. It is important to engage with them early to respond to any questions and concerns that may cause delays later in the leasing process.
- Coordinate with the AF Civil Engineer Support Agency (AFCESA) Utilities Litigation Team. AFCESA will help in negotiating and approving the final agreement.
- Once contract is awarded, a CE representative must conduct regular construction inspections. CE's concern is for the contractors to follow the base's safety and security procedures. CE is also concerned with how the actions of the contractor will affect the base. The extra set of eyes will help identify potential issues early and result in overall risk mitigation and cost savings.

3. Installation Contracting Agency

The installation contracting agency is needed to legally bind the Government and a commercial business to a contract which provides goods or services to the Government.

The installation's contracting agency should take the following actions:

- Bases should contract for renewable energy because it supports Federal renewable energy goals. The Energy Policy Act of 2005 goal of using 7.5% renewable energy by 2013 and 25% by 2025 are directly supported by a base's choice to pursue renewable energy.
- The PV developer should design, finance, build, and operate the PV array of an installation. The base can sign an indefinite utility purchase contract with the developer, including an option to cancel with one year notification. Land can be provided for the PV array via a ground lease.
- A small and dedicated core team should lead the RE initiative when a base takes on the challenge of implementing new renewable energy requirements. Core teams allow for flexibility, quick reaction, and increased sense of ownership and empowerment. The core team should have expertise in contracting, RE technology, law, and economics.

- Potential contract vehicles for a base to consider are ESPC/UESC, EUL, utility purchase, and IFB. There are a number of funding sources to consider as well, including third party, power purchase, and capital investment.
- There are various selection options a contracting squadron needs to consider, such as best value and lowest price technically acceptable. When considering going with best value, a contracting squadron needs to be aware that it is subjective and a protest may be more difficult to defend; however, there is more flexibility in selection, and it will not necessarily be the lowest cost. With lowest price technically acceptable, it is more objective, lower protest risk, and the best price.
- The contracting squadron should be utilized to the fullest extent possible in the process of contracting for renewable energy. Contracting is a separate organization and management chain of command. Its sole purpose is to accomplish proposal evaluations in accordance with the RFP. Contracting will be the source-selection authority and help provide an evaluation team. The selection organization needs to consist of a Source Selection Authority, a Source Selection Evaluation Chairman, a technical team for mission requirement, a past performance team, a pricing team, and corresponding advisors.
- Regarding the technical evaluation, a contracting squadron needs to be aware that there is a technical acceptability phase which is subjective. Marginal proposals have the opportunity to become acceptable. Clearly unacceptable proposals should be eliminated from the competitive range. The offeror needs to demonstrate a definitive plan to meet requirements to include a performance plan, financial capability, implementation plan, and quality management plan. Past performance is important and the offeror should demonstrate successful past performance on like or similar projects when practical. There is a need for the offeror to demonstrate price realism and reasonability. These three factors of mission requirements, past performance, and price are of equal importance.
- The price competition phase is objective, and the contracting squadron should consider: (1) present value cost for PV power using cost per kWh as a bid in the proposal; (2) annual escalation factor as a bid in proposal, and (3) discount factors from OMB Circular A-94.
- Contracting squadrons should consider the lessons learned from the Nellis AFB PV project. In review, the lessons were to consider a competitive RFP solicitation because it ensures the least cost for the Air Force and minimizes potential for protest. An indefinite term utility contract is good because it can be approved and awarded at base level, and a long term lease provides stability required by investors. A small dedicated core team, which was five to eight people at Nellis AFB, is good to have because it

establishes direct, frequent communication, conducts meetings at major milestones, and streamlines RFP development and evaluation processes.

- All stakeholders need to be involved from the start such as real property, contracting, legal, environmental, engineering, security, and others. It is important to include model interconnect agreements in the RFP. Proposals should be clearly ranked in order. Documenting non-conforming proposals is essential and it provides additional support in case of a protest. The business case needs to be formalized for leadership.
- It is recommended to review proposals for stated or implied contingencies and ensure these are eliminated. Funding needs to be secured for EA, EBS, legal survey, and land appraisal before the project moves forward. These tasks must be completed early to avoid delays. A contracting squadron needs to clearly define the calculation for low bid in the RFP and base the calculation on life cycle cost.
- Primary and alternate representatives for all stakeholders should be established because it ensures continuity as primary members may not always be available. Having functional experts readily available ensures quick responses to proposer questions. Also, it is a good idea to educate construction inspectors about unique requirements of the contract vehicle used because many normal construction requirements do not apply.

4. Contractor

Depending on the condition of the land, environmental concerns, and engineering problems, the contractor could avoid wasting a significant amount of time and money by establishing a strong PUC partnership and addressing these issues from the start. Since the contractor sells RECs to the PUC, a clear understanding of these prices is essential for the Contractor to have prior to developing a proposal for the Government renewable solicitation.

- The contractor should negotiate with DoD a responsiveness plan that deals with supporting short notice entrance through base security checkpoints. For example, SunPower may have technical problems that require specialized technicians to fix troubles pertaining to solar energy panels, inverters, the grid, etc. Since, SunPower does not receive a return on investment until after the solar farm is up and running, every time there is a unique problem before the solar energy project is completed, more time is wasted when technician's are unable to fix solar energy problems because they cannot get access through base security checkpoints without long-lead times. The lack of base entry for the contractor's technician results in time and money lost because the technician is unable to repair the solar energy problems timely.

- In order to better manage security issues like this, the contractor and DoD should establish a way to have off-duty military personnel work as paid escorts for these unique situations. For example, at Buckley AFB, off-duty AF personnel were hired to escort contractors while they repaired program problems. Allowing SunPower Corporation to hire off-duty DoD personnel with clearance to act as an independent security escort like at Buckley AFB will improve stop work orders.
- The contractor should develop a strong partnership with the local Public Utility Company (PUC) to better understand both the special circumstances that exists to tie into the PUC energy grid and better understand renewable energy credit prices.

D. AREAS FOR FURTHER RESEARCH

1. International – Foreign Relations Kyoto Accord and host nation agreements: The DoD should make every effort to meet the highest Renewable Energy/Carbon Reduction requirements, whether it relate directly to the Federal Energy Act or the host nations' minimum requirement.
2. AF Energy Strategy second pillar economic analysis: Improve future infrastructure through energy efficient design standards, such as Leadership in Energy & Environmental Design (LEED) principles.
3. How the implementation of a National Identification card would impact base contracting costs with regards to reduced administrative time associated with contractor base access procedures and reduced loss of work from workers being delayed access to on base job sites.

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APPENDIX A. EXEC ORDER 07-374



Federal Register

Friday,
January 26, 2007

Part II

The President

Executive Order 13423—Strengthening
Federal Environmental, Energy, and
Transportation Management

Presidential Documents

Title 3—

Executive Order 13423 of January 24, 2007

The President

Strengthening Federal Environmental, Energy, and Transportation Management

By the authority vested in me as President by the Constitution and the laws of the United States of America, and to strengthen the environmental, energy, and transportation management of Federal agencies, it is hereby ordered as follows:

Section 1. Policy. It is the policy of the United States that Federal agencies conduct their environmental, transportation, and energy-related activities under the law in support of their respective missions in an environmentally, economically and fiscally sound, integrated, continuously improving, efficient, and sustainable manner.

Sec. 2. Goals for Agencies. In implementing the policy set forth in section 1 of this order, the head of each agency shall:

(a) improve energy efficiency and reduce greenhouse gas emissions of the agency, through reduction of energy intensity by (i) 3 percent annually through the end of fiscal year 2015, or (ii) 30 percent by the end of fiscal year 2015, relative to the baseline of the agency's energy use in fiscal year 2003;

(b) ensure that (i) at least half of the statutorily required renewable energy consumed by the agency in a fiscal year comes from new renewable sources, and (ii) to the extent feasible, the agency implements renewable energy generation projects on agency property for agency use;

(c) beginning in FY 2008, reduce water consumption intensity, relative to the baseline of the agency's water consumption in fiscal year 2007, through life-cycle cost-effective measures by 2 percent annually through the end of fiscal year 2015 or 16 percent by the end of fiscal year 2015;

(d) require in agency acquisitions of goods and services (i) use of sustainable environmental practices, including acquisition of biobased, environmentally preferable, energy-efficient, water-efficient, and recycled-content products, and (ii) use of paper of at least 30 percent post-consumer fiber content;

(e) ensure that the agency (i) reduces the quantity of toxic and hazardous chemicals and materials acquired, used, or disposed of by the agency, (ii) increases diversion of solid waste as appropriate, and (iii) maintains cost-effective waste prevention and recycling programs in its facilities;

(f) ensure that (i) new construction and major renovation of agency buildings comply with the *Guiding Principles for Federal Leadership in High Performance and Sustainable Buildings* set forth in the *Federal Leadership in High Performance and Sustainable Buildings Memorandum of Understanding (2006)*, and (ii) 15 percent of the existing Federal capital asset building inventory of the agency as of the end of fiscal year 2015 incorporates the sustainable practices in the Guiding Principles;

(g) ensure that, if the agency operates a fleet of at least 20 motor vehicles, the agency, relative to agency baselines for fiscal year 2005, (i) reduces the fleet's total consumption of petroleum products by 2 percent annually through the end of fiscal year 2015, (ii) increases the total fuel consumption that is non-petroleum-based by 10 percent annually, and (iii) uses plug-in hybrid (PIH) vehicles when PIH vehicles are commercially available at

a cost reasonably comparable, on the basis of life-cycle cost, to non-PIH vehicles; and

(h) ensure that the agency (i) when acquiring an electronic product to meet its requirements, meets at least 95 percent of those requirements with an Electronic Product Environmental Assessment Tool (EPEAT)-registered electronic product, unless there is no EPEAT standard for such product, (ii) enables the Energy Star feature on agency computers and monitors, (iii) establishes and implements policies to extend the useful life of agency electronic equipment, and (iv) uses environmentally sound practices with respect to disposition of agency electronic equipment that has reached the end of its useful life.

Sec. 3. Duties of Heads of Agencies. In implementing the policy set forth in section 1 of this order, the head of each agency shall:

(a) implement within the agency sustainable practices for (i) energy efficiency, greenhouse gas emissions avoidance or reduction, and petroleum products use reduction, (ii) renewable energy, including bioenergy, (iii) water conservation, (iv) acquisition, (v) pollution and waste prevention and recycling, (vi) reduction or elimination of acquisition and use of toxic or hazardous chemicals, (vii) high performance construction, lease, operation, and maintenance of buildings, (viii) vehicle fleet management, and (ix) electronic equipment management;

(b) implement within the agency environmental management systems (EMS) at all appropriate organizational levels to ensure (i) use of EMS as the primary management approach for addressing environmental aspects of internal agency operations and activities, including environmental aspects of energy and transportation functions, (ii) establishment of agency objectives and targets to ensure implementation of this order, and (iii) collection, analysis, and reporting of information to measure performance in the implementation of this order;

(c) establish within the agency programs for (i) environmental management training, (ii) environmental compliance review and audit, and (iii) leadership awards to recognize outstanding environmental, energy, or transportation management performance in the agency;

(d) within 30 days after the date of this order (i) designate a senior civilian officer of the United States, compensated annually in an amount at or above the amount payable at level IV of the Executive Schedule, to be responsible for implementation of this order within the agency, (ii) report such designation to the Director of the Office of Management and Budget and the Chairman of the Council on Environmental Quality, and (iii) assign the designated official the authority and duty to (A) monitor and report to the head of the agency on agency activities to carry out subsections (a) and (b) of this section, and (B) perform such other duties relating to the implementation of this order within the agency as the head of the agency deems appropriate;

(e) ensure that contracts entered into after the date of this order for contractor operation of government-owned facilities or vehicles require the contractor to comply with the provisions of this order with respect to such facilities or vehicles to the same extent as the agency would be required to comply if the agency operated the facilities or vehicles;

(f) ensure that agreements, permits, leases, licenses, or other legally-binding obligations between the agency and a tenant or concessionaire entered into after the date of this order require, to the extent the head of the agency determines appropriate, that the tenant or concessionaire take actions relating to matters within the scope of the contract that facilitate the agency's compliance with this order;

(g) provide reports on agency implementation of this order to the Chairman of the Council on such schedule and in such format as the Chairman of the Council may require; and

(h) provide information and assistance to the Director of the Office of Management and Budget, the Chairman of the Council, and the Federal Environmental Executive.

Sec. 4. *Additional Duties of the Chairman of the Council on Environmental Quality.* In implementing the policy set forth in section 1 of this order, the Chairman of the Council on Environmental Quality:

(a) (i) shall establish a Steering Committee on Strengthening Federal Environmental, Energy, and Transportation Management to advise the Director of the Office of Management and Budget and the Chairman of the Council on the performance of their functions under this order that shall consist exclusively of (A) the Federal Environmental Executive, who shall chair, convene and preside at meetings of, determine the agenda of, and direct the work of, the Steering Committee, and (B) the senior officials designated under section 3(d)(i) of this order, and (ii) may establish subcommittees of the Steering Committee, to assist the Steering Committee in developing the advice of the Steering Committee on particular subjects;

(b) may, after consultation with the Director of the Office of Management and Budget and the Steering Committee, issue instructions to implement this order, other than instructions within the authority of the Director to issue under section 5 of this order; and

(c) shall administer a presidential leadership award program to recognize exceptional and outstanding environmental, energy, or transportation management performance and excellence in agency efforts to implement this order.

Sec. 5. *Duties of the Director of the Office of Management and Budget.* In implementing the policy set forth in section 1 of this order, the Director of the Office of Management and Budget shall, after consultation with the Chairman of the Council and the Steering Committee, issue instructions to the heads of agencies concerning:

(a) periodic evaluation of agency implementation of this order;

(b) budget and appropriations matters relating to implementation of this order;

(c) implementation of section 2(d) of this order; and

(d) amendments of the Federal Acquisition Regulation as necessary to implement this order.

Sec. 6. *Duties of the Federal Environmental Executive.* A Federal Environmental Executive designated by the President shall head the Office of the Federal Environmental Executive, which shall be maintained in the Environmental Protection Agency for funding and administrative purposes. In implementing the policy set forth in section 1 of this order, the Federal Environmental Executive shall:

(a) monitor, and advise the Chairman of the Council on, performance by agencies of functions assigned by sections 2 and 3 of this order;

(b) submit a report to the President, through the Chairman of the Council, not less often than once every 2 years, on the activities of agencies to implement this order; and

(c) advise the Chairman of the Council on the Chairman's exercise of authority granted by subsection 4(c) of this order.

Sec. 7. *Limitations.* (a) This order shall apply to an agency with respect to the activities, personnel, resources, and facilities of the agency that are located within the United States. The head of an agency may provide that this order shall apply in whole or in part with respect to the activities, personnel, resources, and facilities of the agency that are not located within the United States, if the head of the agency determines that such application is in the interest of the United States.

(b) The head of an agency shall manage activities, personnel, resources, and facilities of the agency that are not located within the United States, and with respect to which the head of the agency has not made a determination under subsection (a) of this section, in a manner consistent with the policy set forth in section 1 of this order to the extent the head of the agency determines practicable.

Sec. 8. Exemption Authority. (a) The Director of National Intelligence may exempt an intelligence activity of the United States, and related personnel, resources, and facilities, from the provisions of this order, other than this subsection and section 10, to the extent the Director determines necessary to protect intelligence sources and methods from unauthorized disclosure.

(b) The head of an agency may exempt law enforcement activities of that agency, and related personnel, resources, and facilities, from the provisions of this order, other than this subsection and section 10, to the extent the head of an agency determines necessary to protect undercover operations from unauthorized disclosure.

(c) (i) The head of an agency may exempt law enforcement, protective, emergency response, or military tactical vehicle fleets of that agency from the provisions of this order, other than this subsection and section 10.

(ii) Heads of agencies shall manage fleets to which paragraph (i) of this subsection refers in a manner consistent with the policy set forth in section 1 of this order to the extent they determine practicable.

(d) The head of an agency may submit to the President, through the Chairman of the Council, a request for an exemption of an agency activity, and related personnel, resources, and facilities, from this order.

Sec. 9. Definitions. As used in this order:

(a) “agency” means an executive agency as defined in section 105 of title 5, United States Code, excluding the Government Accountability Office;

(b) “Chairman of the Council” means the Chairman of the Council on Environmental Quality, including in the Chairman’s capacity as Director of the Office of Environmental Quality;

(c) “Council” means the Council on Environmental Quality;

(d) “environmental” means environmental aspects of internal agency operations and activities, including those environmental aspects related to energy and transportation functions;

(e) “greenhouse gases” means carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride;

(f) “life-cycle cost-effective” means the life-cycle costs of a product, project, or measure are estimated to be equal to or less than the base case (i.e., current or standard practice or product);

(g) “new renewable sources” means sources of renewable energy placed into service after January 1, 1999;

(h) “renewable energy” means energy produced by solar, wind, biomass, landfill gas, ocean (including tidal, wave, current and thermal), geothermal, municipal solid waste, or new hydroelectric generation capacity achieved from increased efficiency or additions of new capacity at an existing hydroelectric project;

(i) “energy intensity” means energy consumption per square foot of building space, including industrial or laboratory facilities;

(j) “Steering Committee” means the Steering Committee on Strengthening Federal Environmental, Energy, and Transportation Management established under subsection 4(b) of this order;

(k) “sustainable” means to create and maintain conditions, under which humans and nature can exist in productive harmony, that permit fulfilling

the social, economic, and other requirements of present and future generations of Americans; and

(l) "United States" when used in a geographical sense, means the fifty states, the District of Columbia, the Commonwealth of Puerto Rico, Guam, American Samoa, the United States Virgin Islands, and the Northern Mariana Islands, and associated territorial waters and airspace.

Sec. 10. General Provisions. (a) This order shall be implemented in a manner consistent with applicable law and subject to the availability of appropriations.

(b) Nothing in this order shall be construed to impair or otherwise affect the functions of the Director of the Office of Management and Budget relating to budget, administrative, or legislative proposals.

(c) This order is intended only to improve the internal management of the Federal Government and is not intended to, and does not, create any right or benefit, substantive or procedural, enforceable at law or in equity by a party against the United States, its departments, agencies, instrumentalities, entities, officers, employees or agents, or any other person.

Sec. 11. Revocations; Conforming Provisions. (a) The following are revoked:

(i) Executive Order 13101 of September 14, 1998;

(ii) Executive Order 13123 of June 3, 1999;

(iii) Executive Order 13134 of August 12, 1999, as amended;

(iv) Executive Order 13148 of April 21, 2000; and

(v) Executive Order 13149 of April 21, 2000.

(b) In light of subsection 317(e) of the National Defense Authorization Act for Fiscal Year 2002 (Public Law 107-107), not later than January 1 of each year through and including 2010, the Secretary of Defense shall submit to the Senate and the House of Representatives a report regarding progress made toward achieving the energy efficiency goals of the Department of Defense.

(c) Section 3(b)(vi) of Executive Order 13327 of February 4, 2004, is amended by striking "Executive Order 13148 of April 21, 2000" and inserting in lieu thereof "other executive orders".



THE WHITE HOUSE,
January 24, 2007.

APPENDIX B. DOD RE 2005

Office of the Secretary of Defense

REPORT TO CONGRESS

Department of Defense

DoD Renewable Energy Assessment

Final Report



14 March 2005

Executive Summary

The Department of Defense is pleased to submit this report to Congress, outlining a short- and long-term strategy that will increase DoD's use of renewable energy as well as provide a model for approaches by other government agencies.

The report responds to a Congressional request to DoD to conduct a cross-Service assessment of renewable energy alternatives at or near military installations (Senate Report 107-68). It was led by the Air Force, which formed a Renewables Working Group (RWG) for the assessment. The RWG comprised representatives from each of the Services, the U.S. Department of Energy (DoE) and DoE national laboratories, and the renewables industry.

We evaluated renewable resources on and near installations, developed purchasing strategies, evaluated the impact renewables have on energy security, and prepared a roadmap for the future. This report focuses on wind, geothermal, and solar energy, with the solar component including photovoltaic (PV), solar thermal, daylighting, and transpired heat collection. The latter technology is like a second skin for buildings and is used in colder climates to preheat ventilation air for buildings. Regarding these specific technologies, the study found that:

- Where economical, DoD should pursue on-installation production of renewable energy because it provides energy savings, reduces our dependence on foreign energy, and saves money, while increasing energy security.
 - There is good potential for wind projects where utility rates are high or where power is generated at remote sites and a wind-diesel hybrid can be developed.
 - Geothermal energy provides high-density power and there are a few potentially viable resources on DoD property. The Navy's China Lake, California, geothermal power plant is operational.
 - Solar photovoltaic (PV) is still very expensive but could be economical where there are very high utility costs, where state and Federal rebates and tax incentives are in effect, and/or where there are state mandates requiring utilities to provide power from PV.
 - The best solar potential is in daylighting, transpired heat collection, and solar thermal applications.
- Purchasing energy produced from renewable resources can provide the greatest source of renewable energy, but is difficult to do since each procurement has many complexities:
 - Goal is to purchase at or near current utility rates on a lifecycle cost basis.
 - Purchasing green attributes (Green Tags) instead of energy is the approach of many Federal agencies, but DoD's preference is to encourage purchasing the renewable energy itself when economical from a lifecycle perspective.
- Long-term aggregated purchases by region appear to be the best purchasing option, although some installations will find local opportunities that should not be overlooked:
 - Easiest to execute contracts in deregulated states.
 - Federal power marketers such as Western Area Power Administration (WAPA) and Bonneville Power Authority (BPA) can aggregate and deliver renewable power to their Federal customers within regulated states.
 - The Defense Energy Support Center (DESC) is also an important aggregator.
- Biomass—although not studied in depth—shows promise, especially in areas without other renewable resources, but needs low transmission costs and cooperative utilities. Lack of utility support (the norm) will force plants to be built on or adjacent to installations, requiring time-consuming and complex efforts by the military installation and supplier.

- There are few installations capable of supporting large utility-sized renewable systems.
- On-installation renewable energy production as well as some off-installation production contributes to the energy security of the installation if grid power is lost.

Although there has been a steady increase in DoD's use of renewable energy over the last few years, the strategies outlined herein lay the groundwork for greater gains in the future. General conclusions follow:

- The renewable energy industry continues to grow in capacity and is steadily improving technologies to enhance performance, rendering it increasingly cost-competitive. DoD can become the early market of choice, benefiting from these trends.
- Because long-term costs are predictable for renewable energy but not for fossil fuels, long-term contracts to purchase renewable energy will deliver cost stability and be a hedge against future energy price increases.
- Renewable energy technologies have the greatest potential in specific geographic regions and should be selected to optimize this potential.
- While the technologies assessed herein have proven dependable and cost-effective in appropriate situations, DoD is continuing its historic role as a catalyst for the development of other emerging renewable technologies.
- On-installation and, in certain cases, regional grid-level renewable energy production may improve energy security and be more cost-effective than conventional emergency power generation.

DoD has a long history of pursuing renewable energy to meet its energy needs. At the end of 2004, 2.5% of energy used by U.S. military installations came from renewable sources (6% if renewable power from pre-1990 plants and other sources are included). This percentage continues to increase as the performance of renewable energy technologies improves and costs are reduced. The renewable energy is a mixture of on- and near-installation generation and cost-effective long- and short-term renewable electricity purchases from third-party providers. While the current level of DoD's renewable energy use meets the Federal goal set by DoE, it only represents a small fraction of the possibilities. Attached to this report is an implementation plan describing recent renewable initiatives.

Our renewable energy vision is to maintain a commitment to renewable energy supported by a DoD-wide appreciation for the economic, environmental, and security benefits of renewable energy technologies. DoD's program includes:

- Financial support for implementing demonstrated, economical technologies that are especially applicable for DoD's energy needs.
- Sponsoring a wide variety of demonstration projects where compatible with the installation's mission and the rapid evolution of those projects to full-scale deployments.
- Continuing evaluation of renewable resource opportunities.
- Careful attention to lessons learned and the rapid dissemination of those lessons.
- Development and continued improvement of effective contracting vehicles.
- Innovative approaches for attracting private capital for on-installation development.
- Effective and continuing education of those having the responsibility for acquisition and management of energy and energy systems.

After significant on-installation evaluations, including emplacing wind metrology towers at twenty locations, geothermal studies, and developing software to analyze solar potential, the following possibilities exist:

- The final wind potential could be as much as 70 average megawatts (MWa) on 109 facilities. This is an optimistic projection since it represents the resource only. Factors such as economics, mission, and the environment have not been considered. (Note: Wind and solar produce power intermittently; thus 10 MW of capacity may only produce an average of 3 MW, therefore the term “MWa” meaning “megawatt average”)
- Three installations assessed for geothermal power generation may offer a commercially viable resource with a fourth warranting further evaluation. Six to eight installations show some promise as a source of heating grade energy and merit further research.
- Four hundred thirty locations were evaluated for solar potential and at least one of the solar technologies evaluated (primarily daylighting) was feasible at most locations.

Although biomass was not a part of the study, we found many biomass energy opportunities, especially in locations where other renewable resources are limited. This is especially true in the Southeast region of the country where animal waste is extremely plentiful and has become an environmental liability. However, most states with the problem do not have deregulated utilities, making economical acquisition of the power challenging, yet still worth the effort.

Evaluation of on-installation resources did not identify large sources of renewable energy but nearly all installations could field some type of renewable project. On-installation presence of renewable projects is important for raising the energy awareness of personnel. There are a few installations with utility-grade wind, geothermal or solar resources, but these are the exceptions. While there are numerous opportunities for smaller-scale generation, it is through the purchase of commercially developed renewable energy where the greatest amount of renewable energy can be obtained. A number of purchasing strategies were developed and are currently being systematically tested. The goal is to purchase renewable energy at or near the price of conventional energy. This report covers a number of strategies but the primary focus is on using DoD's purchasing power to encourage development of renewable resources. One way to acquire renewable energy in the Federal government is through the purchase of renewable attributes called “Green Tags.” This approach nearly always results in a surcharge on the cost of energy ranging from hundredths of a cent up to as much as 4 cents per kilowatt-hour (kWh). Although tag buys at low cost have a place in certain situations, DoD focuses on energy purchases where premiums are not required or where local circumstances justify a small premium.

Energy security requirements vary with installation missions. Studies were performed to evaluate the role renewables could play in energy security, especially wind and solar which by nature do not provide consistent output. It was found that renewables have the potential to provide added energy security when the source of generation is on the installation. Renewables in close proximity and which can be dedicated to the installation, especially when teamed with existing diesel power sources, can also contribute to energy security, although electric lines transmitting this power to the installation could be at risk. In some cases, where energy security needs are high, it could be more cost-effective to pay a slightly higher cost for renewable energy than to acquire more conventional alternatives.

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Introduction

Congress asked DoD to conduct a cross-Service assessment of renewable energy alternatives at or near military installations as described in Senate Report 107-68.

Additionally, the FY 2004 (MILCON) report provided the following guidance to DoD on renewable energy:

ENERGY CONSERVATION INVESTMENT PROGRAM...The Committee also directs the Department to provide to the congressional defense committees a strategy and projected budget for implementing the findings and recommendations of the [final report to Congress] within 90 days after the completion of the report. The plan should include the following elements: a detailed budget proposal and timeline encompassing short term and long term objectives; management and personnel requirements to execute the plan in each of the Services; and an explanation of any changes needed in procurement, legal, or regulatory requirements to streamline the procurement of renewable energy at U.S. defense installations. The plan should also provide a detailed description of standardized processes and procedures to provide ongoing program support and address operational, environmental, cost, education, and technology issues.

The Air Force was designated as the lead component for the renewable energy assessment and formed a Renewables Working Group (RWG) to conduct the assessment. The RWG membership includes representatives from the Air Force, Army, Navy, Marine Corps, and the U.S. Department of Energy's (DoE) Pacific Northwest National Laboratory, National Renewable Energy Laboratory, Sandia National Laboratories, and Idaho National Engineering and Environmental Laboratory. Representatives from the renewable industry trade associations, DoE headquarters, and universities were also consulted and provided valuable contributions to the work.

In May 2002, DoD provided Congress with an interim report describing the scope of the renewables assessment and the intended analytical products.

Renewable Energy Can Serve the Military Mission

Executive Order (E.O.) 13123, *Greening the Government through Efficient Energy Management*, allows credits for renewable energy activity toward Federal agency conservation goals. The Administration's national energy plan, *Reliable, Affordable, and Environmentally Sound Energy for America's Future*, encourages development of renewable resources on Federal land. A finding of this report is that renewable energy, in some cases, can also serve and sometimes enhance the military mission. These contributions, while understood by military engineering personnel, are largely unknown to potential users in the larger military population.

Renewable energy can make a valuable contribution to flexible, reliable, and secure electricity supplies for military installations in specific locations. These findings are described in the "Renewables and Security" section of this report. Some renewable electricity contracts may also provide a hedge against rising electricity costs; these opportunities and the test case to lay an implementation path forward are described more fully in the "Purchasing Strategy" section of the DoD Renewable Assessment Implementation Plan. DoD has identified installations where renewable energy generation may be developed onsite, economically and consistent with the mission. Some renewable products and services may also help reduce the logistical requirements on military installations and ranges. These opportunities are described in the "On-Installation Resource Development" section of this report.

DoD Renewable Energy Goal

Near-Term Goals

E.O. 13123, *Greening the Government through Efficient Energy Management*, establishes energy efficiency goals for all Federal agencies and directs DoE to establish renewable energy goals. DoD has met DoE's currently specified renewable energy goal and is working with DoE to set a new goal for the future. This goal will further increase the use of renewable energy and will be incorporated into DoD instructions on energy policy and executed in collaboration between the Office of the Secretary of Defense (OSD) and the Services.

At this writing, the greatest potential for reaching a new goal is through short- and long-term purchase agreements. A key purchasing component is to supply loads aggregated across multi-Service installations in a regional market. The RWG concludes that by aggregating loads to increase the size of the projected power purchase, and by establishing standardized contract terms for up to twenty years, the military can obtain prices economically equal to or better than existing short-term contracts for conventionally generated electricity. While purchasing renewable energy supplants an equal amount of fossil energy it does not always lower an installation's energy bill nor provide secure, on-base power generation as does renewable energy produced on base. For that reason, an element of each goal also includes on-installation renewable projects where resource development is consistent with mission operations.

In the coming months, DoD will examine and verify the costs, benefits, and resources required for each option. The OSD will encourage the institutional changes necessary to accelerate the DoD's use of renewable energy, including electricity generated from renewable resources.

Long-Term Goals

Congress provided funds to assess wind, solar, and geothermal generation potential on military installations and to develop purchasing strategies for renewable-based generation from the private sector. In response, the RWG developed twenty individual purchasing opportunities for approximately ninety major installations in twenty-six states. Efficiency improvements in renewable technologies, rising prices in electricity markets, and additional utility deregulation will create increased opportunities in the future. Approximately 105 installations, mostly small in area, will undergo economic and mission evaluations to determine the potential for small wind projects. Three to twelve sites show some geothermal potential, and as many as 430 sites may have some potential for at least one of the commercial solar technologies the RWG found suitable for military use.

The Services are investigating other promising renewable technologies, including some with near-term potential for application on and near installations and in-theater. These include biomass, ocean-thermal, wave, and river-current technologies for coastal and riverside installations and a wide range of flexible solar technologies for use in the field. The military role in the United States is expanding in support of civilian homeland security protection and response activities. Force protection on installations is a necessary component of this support. The Services will continue to identify, validate, and test the full range of emerging renewable technologies that have the potential to support critical functions, improve installation perimeter security, and provide mobile power for first-responders and expeditionary forces in the field.

On-Installation Resource Development

Congress directed an assessment of wind, solar, and geothermal energy potential on U.S. military installations, and provided additional guidance during the assessment to accomplish the following:

- Evaluate the value of renewable electricity generation for installation security.
- Provide standardized rules and procedures for facilitating government/industry renewable energy partnerships on military property.

The RWG provided DoD with a roadmap that identifies where and how geothermal, wind, and PV electricity can best be generated on specific installations consistent with financing, environmental concerns, and mission constraints. From a pool of 900 installations covering 22 million acres with 280,000 buildings, the RWG, using the latest renewable energy resource data, selected a subset of installations for detailed installation-specific assessments. These included eighteen for geothermal assessment, seventy-five with high potential for wind development, and data to evaluate 430 sites for solar resources.

The geothermal assessments updated twenty-year-old resource data with the most recent scientific literature and information gathered during visits to selected sites. Site-specific wind data was collected at each of the most promising twenty sites; the remaining wind sites were assessed using historical data. The solar assessment included 430 major locations. Software was developed for the study to further narrow the large number of potential solar candidates. Site evaluations were performed on a sampling of those sites to validate the solar evaluation software. A small number of site-specific solar assessments are continuing, using funding provided by Congress to support this report and by DoE's Federal Energy Management Program (FEMP).

Findings

The installations assessed have the potential to generate between 37 and 210 average megawatts (MWa) annually by 2020, which could provide additional capacity equivalent to between 1% and 6% of DoD's current electricity use. The larger figure is a practical maximum since mission, environmental, and cultural issues must be considered in-depth.

1. Three out of the eighteen installations assessed for geothermal generation offer what might become a commercially viable resource, with a fourth needing more evaluation. Six to eight additional installations show hot water potential and merit further research.
2. The final wind resource potential, including small wind, could be up to 70 MWa at 109 facilities, although mission, environmental, and other limitations will significantly reduce this potential.
3. The potential for one or more types of solar projects exists at each of the 430 locations assessed. These projects covered 1) grid-connected PV systems; 2) hybrid diesel/PV for remote applications; 3) solar hot water for domestic use, process loads, and pool heating; 4) transpired heat collectors to reduce space heating requirements; and 5) daylighting to replace electric lighting in warehouses and hangar-type buildings. Fulfilling this potential requires significant subsidies from states and utilities.

Table 1 summarizes the electricity generation potential identified by the assessment.

Table 1. Summary of Findings

Finance Source	Wind		Geothermal		Solar PV		Solar Thermal	
	Sites	MW _a	Sites	MW _a	Sites	MW _a	Sites	MW _a
Third Party	2	60.9	4	40	38	56.5	N/A	N/A
MILCON (ECIP)	107	9.2	N/A	N/A	4	12.2	up to 430	25
Total	109	70.1	4	40	42	68.7	up to 430	25

N/A = not applicable

ECIP = Energy Conservation Investment Program

The actual electricity generation achieved will depend upon several factors, including the mission, resolution of some resource uncertainties, continued state and utility subsidies of solar projects, and the development of more effective third-party financing methods.

DoD's challenges in pursuit of on-installation renewable electricity generation include the following:

1. Access to third-party investment funds (such as provided by independent power producers [IPP]) is dependent on the quality of the energy source which may be better off the installation.
2. MILCON Energy Conservation Investment Program (ECIP) funding is available for renewable projects, but require greater investment than privately funded projects because the government cannot benefit from state and Federal tax incentives. Generation projects that support mission goals and cannot attract private funding should be funded as priority ECIP projects.
3. Electric utilities tend to increase tariffs and backup capacity costs for installations that self-generate part of or their entire load, often to the extent that the projects become uneconomical.
4. Renewable generation projects can conflict with existing and planned military land uses. Incompatibility with existing military operations is often clear and definitive. Compatibility with future land and air use is unclear; productive sites can lay dormant in anticipation of future land and airspace needs. Planning can be accomplished primarily through Geographical Information System (GIS) evaluations using data from this assessment.
5. On-installation development of renewable potential will advance planning and in-depth coordination with installation commanders. Because of the potential conflict with or impact of renewable projects on an installation's mission, development of certain projects may be dismissed as too difficult, not feasible, or not in the best interest of the government.
6. Many of the current Energy Savings Companies (ESCO) lack expertise and experience with renewable technologies, resulting in an underutilization of Energy Savings Performance Contracts (ESPC).

Financing Options

The economic feasibility of on-installation renewable generation depends on available financing. Three financing models were evaluated:

- The IPP model, where third-party developers construct, own, and operate power projects on DoD property for sale to the grid on a wholesale basis.
- The Independent Energy Provider (IEP) model, where third-party developers construct, own, and operate power projects on DoD property for retail sale to the installation.
- The ECIP, a line item in the Military Construction Appropriation.

The IPP and IEP models are viable third-party financing options. The IPP approach is widely used but restricted to the sale of power to competitive wholesale power markets rather than to retail customers. The IEP concept, as conceived by the RWG for this analysis, is a variation of the IPP model that provides retail power to the installation. The IEP model may improve project economics if the project can combine the benefits of a large captive electrical load, the credit-worthiness of the U.S. Government, and tax incentives available to private developers. The IEP concept is now being tested at a Western Air Force base.

Aligning the three alternative financing models against the commercially viable renewable generation projects identified in this assessment, the RWG finds the following:

- The geothermal projects can/should be funded through the IPP or IEP models.
- Two of the potential wind projects may be profitable enough to attract IPP implementation; the rest could be developed under IEP or ECIP.
- The solar projects are not as easily categorized because local rebate and tax incentive programs are critical to project economics. The analysis found that PV and solar thermal (including daylighting) projects could supplant about 37 MWa or roughly 1% of DoD's U.S. electricity under ECIP funding alone. An additional 57 MWa, for a total of 94 MWa—2.6% of total consumption—could be financed if private sector investments were available. Most of the potential lies in grid-connected solar PV projects in states that currently have generous solar incentives.

Renewables and Security

On-installation renewable power generation can contribute to installation energy security when the generation provides continually available power or seamlessly provides backup power. This can be accomplished through renewable power alone at a handful of installations with excellent resource potential. It may also be accomplished on a much larger number of installations when renewable generation is used in combination with the standard complement of backup diesel generators. Use of renewable resources to power remote facilities and installation perimeter security devices can also significantly improve installation security.

Combining Renewable Power with Diesel Generation on Installations

Economic analysis supports on-installation power generation from renewables. Detailed analyses show that power generated from geothermal, wind, or a combination of wind and solar resources is frequently less expensive on a simple payback basis than additional (equivalent) supplementary diesel generation. This is largely because renewable sources also provide no-cost energy when there is no emergency and backup generators lie dormant. Over time, these renewable investments provide a pay-back whereas conventional diesel generation just continues to accumulate cost.

The intermittent nature of wind and solar energy and the distance they are removed from the critical load currently prohibit direct replacement of diesel generators. However, renewable generation equipment can be coordinated with diesel generators in two ways. First, output can be used to relieve the continuous demand on backup diesel, lengthening the time diesel generators can operate without refueling or maintenance. Second, renewable generation can increase the total power available on the installation, expanding the facilities and operations that can be served simultaneously during a grid outage.

The specific role of any renewable power generation will depend upon its nature (e.g., continuous geothermal versus more variable wind and solar generation), the renewable resource diversity provided by the installation's geography, and the unique installation demand characteristics. Simulations of various combinations of renewable and backup diesel generation demonstrate that the intermittency of both wind and solar resources presents complications but does not prevent them from serving as important energy security components. A cost-effective mass energy storage medium—possible in the near future given the amount of research and development currently being invested by DoE and industry—may make the intermittency of renewable energy irrelevant and allow renewable energy sources to become direct substitutes for diesel generators. Given the lack of emissions, renewable emergency power sources are also environmentally preferable. However, there is no blanket recipe for renewables to support energy security—the role of available renewable resources must be specifically designed for each installation.

Micro-Grids

Recent major grid failures and the vulnerability of the grid to terrorist actions have caused an increase in interest in energy security for DoD installations. One way to reduce the effect on an installation is the development of micro-grids. A micro-grid is the interconnection of modular generation sources to a distribution system serving a specific set of loads. The micro-grid is part of the main power network that can be operated autonomously when the main grid is down to continue to provide uninterrupted power to critical interconnected loads.

One way DoD facilities can address increased reliability needs is through micro-grids that include both on-installation and, in some cases, near-installation generation resources, including renewable resources.

If local utilities and the Services work together to develop resources across installation boundaries or adjacent to an installation, local energy security and reliability may be significantly improved, benefiting utility providers, military customers, and the surrounding community.

Energy Security Assessment

The energy security assessment evaluated whether using renewable energy has the potential to enhance supply reliability and overall security at military installations. In general, if renewable resources are to provide reliable power and heat for installations, they must be compatible with mission activities, affordable, and available during grid outages and other regional energy emergencies. The energy security benefits of renewable generation were evaluated by measuring their contribution during a simulated grid outage of up to 30 days at an operating military installation. The installation analyzed has a base load of 13 MW and a peak demand of 20 MW. Like many installations, it has emergency back-up diesel generators sufficient to provide power for 20% of its peak demand for up to two weeks. In the event of a planned terrorist act or a major natural disaster, a longer outage could occur. Such an outage would affect natural gas and diesel fuel resupply, making it important to stretch the availability of the diesel generators. Outages of up to 30 days were simulated using backup power from diesels and/or renewables sufficient to supply 10 MW of power more or less continuously. Power output from renewables and/or supplemental diesel generators operating with existing diesel generators was simulated against installation loads. The costs and benefits of each option were compared over a twenty-year period.

Findings

When operated with emergency diesel generators, as little as 5 MW of wind, solar photovoltaics, and/or geothermal power extend an installation's ability to continue its mission during simulated outages. Ancillary findings include the following:

- The variability of renewable energy does not diminish electricity reliability because the output from intermittent renewable generation (e.g., wind and solar) is largely predictable and can be managed by coordinating the operation of backup diesel generators. It is also possible to store excess energy when renewable power output is high.
- In some cases, an installation can depend on nearby generation, including renewable energy for its backup energy supply where the utility has the capability of segregating its service area from outside influences. This creates self-sustaining regional "islands" which should not be overlooked as installations engage in emergency planning to serve critical installation functions. Planning must necessarily be coordinated with regional energy suppliers, transmission companies, and major energy users.
- Clean air regulations do not restrict renewable hours of operation. Renewable power may be more reliable during routine or prolonged power outages than conventional diesel generators, which may have restricted hours of operation.

Comparative Cost Findings

DoD analyzed the economics of renewable systems using conventional payback models and energy consumption and power plant simulation tools. The performance and cost of renewable deployment and baseline diesel backup systems were based on operating facilities and installation records.

On-installation and near-installation generation options were considered.

Although more costly to install than backup diesel generators, renewable energy systems can provide reliable and economical backup power for military installations. The financial benefit stems from their continuing power production which reduces power purchased from the grid and frequently lowers the demand charge; this more than offsets their higher initial cost. The findings for specific configurations are:

- *Geothermal Power Plants.* The per-kilowatt capital cost for a geothermal plant is significantly higher than that of backup diesel generators. However, the continuous, reliable power supplied by the geothermal plant will result in rapid payback and a net benefit (over twenty years) of five times its incremental investment cost.
- *Wind Power Plants.* The per-kilowatt capital cost for wind power is about three times that of backup diesel generators. The predictable power supplied by the wind plant results in acceptable payback and a net benefit (over twenty years) of about one and one-half times its incremental investment cost.
- *Hybrid Wind/Solar Power Plants.* The per-kilowatt capital cost of a hybrid plant is about nine times that of backup diesel generators. The value of the predictable power from this hybrid plant will pay back the incremental investment cost within the twenty-year analysis period.
- *Solar Power Plants.* The per-kilowatt capital cost of a solar deployment is about ten times that of backup diesel generation. In an analysis at a California installation, the pure solar deployment did not pay back within the twenty-year analysis period.

This payback analysis is based on commercial investment costs and excludes government financial incentives. Including these incentives would significantly improve the performance of each renewable project, potentially making the pure solar option cost-effective.

Next Steps

These key steps should be taken to validate, extend, and implement findings:

1. DoD is considering options to accomplish a pilot project to test the above analysis. Based on the results, DoD will recommend strategies to the Services that incorporate renewable energy.
2. Based on the results of step 1, encourage installations to evaluate renewable energy alternatives as part of contingency planning for grid outages. Planning should be done regionally, include regional utilities and suppliers, and consider the use of the installation's renewable energy capacity as part of a local islanding strategy.
3. Replicate the successes of pilot projects at other military installations with full-scale development of on-installation or nearby renewable resources.

Critical Functions, Perimeter Security, Remote Facilities, and Combat

DoD is exploring multi-functional use of several renewable technologies that could simultaneously serve installations, force protection, remote power on ranges, and the expeditionary force (base forwarding and combat uses.) For example, Air Force installations and

readiness offices are collaborating with military laboratories and the Center for Army Analysis to determine how wind and solar products can support installations and help minimize logistical support requirements in-theater. Military transformation plans state:

...the U.S. must prepare for new forms of terrorism... information attacks on its networks, cruise and ballistic missile attacks on its forces and territory, and attacks by chemical, biological, radiological, nuclear, or high-explosive (CBRNE)-armed adversaries. It must also cope with the unique demands of peace operations, homeland security, urban operations, and low-intensity conflicts. To deal with this new security environment...the US military must be able to conduct operations effectively across the entire spectrum of conflict against a broad range of potential adversaries... (with processes that achieve and maintain) advantage through changes in operational concepts, organization, and/or technologies that significantly improve its war fighting capabilities or ability to meet the demands of a changing security environment.

Some remote installation energy requirements currently being evaluated for renewable energy applications by the Army are listed in Table 2.

Table 2. Remote Missions on Military Installations

Installation Mission Using Renewables	No. of Sites
Air Quality Survey Stations	10
Landfill and Landfill Monitoring Stations	3
Radio Repeater Sites	7
Weather sites	12
Remote Site Lighting	8
Target Support	1,900
Town MOUT	1
Chemical Factory MOUT	1
Airfield MOUT	1
Tunnel Complex MOUT	1
Communications Facility MOUT	1
Fortress MOUT	1
Forward Operating Bases	5
Homeland Security (e.g., remote video monitoring, gate guard lighting)	20
Test Instrumentation Shelters	17

MOUT = Military Operations on Urban Terrain

These activities were drawn from Yuma Proving Ground, Arizona; White Sands Missile Range, New Mexico; Yakima Training Center, Washington; Pohakoloa, Hawaii; Fort Bliss, Texas; Fort Irwin, California; and Fort Lewis, Washington. Some installations have more or fewer sites than indicated, depending on mission. Renewable uses in combat are varied and cover watts to kilowatts. Typical deployed military missions being supported today or are in the planning stages include renewable power for tactical operations centers, hospital units, forward operating bases, and provisional response teams.

Conclusions

Renewable energy can assist military installations in meeting efficiency goals set by Congress and the Administration (e.g., E.O. 13123) and aid in exceeding them. Renewable energy sources may also provide DoD installations with environmental benefits such as reduced emissions.

DoD has used renewable energy in small amounts for several decades; approximately 2.5% of DoD's electricity supply now comes from renewable energy (6% if renewable power from pre-1990 plants and other sources are included). Growing competitive markets, rising fuel costs, energy reliability challenges, increasing renewable product performance, and the requirements of E.O. 13123 provide incentives to substantially increase DoD's use of renewable energy.

As the renewable energy industry grows, the performance of renewable energy technologies will continue to improve. Because the price of power from conventional sources continues to rise, the opportunity for cost-effective renewable energy supply will become greater and more geographically widespread. DoD can benefit from these trends by serving as the early market of choice for renewable energy providers, establishing streamlined procurements, and providing equipment manufacturers with sustained markets that allow economies of scale to further reduce the cost of renewable energy products.

Wind, solar, geothermal, and (to some extent) biomass provide the greatest potential in specific geographic regions, and the most cost-effective generation facilities will be located in these regions. These resources are not point sources, but rather distributed resources that may cover parts of an installation and surrounding lands. Hence, the identification of optimal deployment sites and the integration of these resources into the regional electricity grid are best accomplished cooperatively by all interested partners. DoD installations must actively seek the cooperation and participation of neighbors (suppliers, energy transmitters, and large energy users) in larger-scale renewable energy electricity purchases.

On-installation and/or regional grid-level renewable energy production may improve energy security at DoD facilities under some circumstances, and could be more economical on a lifecycle basis than backup diesel generators.

Identifying and developing renewable energy potential is an ongoing effort as technology continues to evolve and become more economical. The potential identified through this assessment effort must now be examined on a case-by-case basis. Where there is no conflict with installation mission or land use, projects must be planned and designed to maximize return on investment. The planning process will determine which projects warrant further consideration and eventual execution.

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APPENDIX C. FINAL LEASE

FA4861-06-D-B500
Attachment 2
May 23, 2006

LEASE NO: _____
DEPARTMENT OF THE AIR FORCE
MODEL LEASE AGREEMENT OF PROPERTY
ON NELLIS AIR FORCE BASE, NEVADA

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LEASE NO: _____

**DEPARTMENT OF THE AIR FORCE
MODEL LEASE AGREEMENT OF PROPERTY
ON NELLIS AIR FORCE BASE, NEVADA**

THIS GROUND LEASE ("Lease") is made and entered into as of _____, 2006, by and between the Secretary of the Air Force, on behalf of the United States of America ("Government" or "Air Force"), and _____ ("Lessee" or "_____"). The Government and the Lessee may be referred to jointly as the "Parties," and each separately may be referred to as a "Party."

Recitals

A. The Air Force is required under the Energy Policy Act of 2005 to purchase energy from renewable sources, such as solar technology, starting in 2007.

B. The Secretary of the Air Force is entering into this Lease under the authority of 10 U.S.C.A. § 2667 and has determined, in accordance with that authority, that the property hereby leased is not excess property, as defined by 40 U.S.C.A. § 102, and leasing the property will be advantageous to the United States and in the public interest.

Leased Premises

NOW, THEREFORE, the Secretary of the Air Force, by virtue of the authority conferred by law, for the consideration set out below, hereby leases to the _____ certain premises consisting of two (2) parcels of land and any improvements thereon situated within the boundaries of Nellis Air Force Base ("AFB"), Clark County, Nevada, as more particularly described in Exhibits A and B hereto, together with reasonable rights of ingress and egress thereto (collectively, "Leased Premises"), for purposes of design, construction, establishment, operation and maintenance of an 18 MW Solar Photovoltaic Array ("PV Array") to supply and deliver renewable (solar power) utility service to Nellis AFB—all as more fully provided elsewhere in the Lease.

THIS LEASE is granted subject to the following conditions:

Conditions

1. **TERM AND DELIVERY OF POSSESSION**

1.1. This Lease shall be for a term of twenty (20) years beginning on _____, 2006 ("Term Beginning Date"), and ending on _____, 2026, unless sooner terminated in accordance with the provisions of this Lease (the "Term").

1.2. Possession of the Leased Premises shall be delivered on the Term Beginning Date, and Lessee shall take possession of the Leased Premises on the Term Beginning Date.

2. EASEMENTS AND RIGHTS-OF-WAY

2.1. This Lease is subject to all outstanding easements and rights-of-way (collectively, "Outgrants") for any purpose with respect to the Leased Premises. The Government shall have the right to grant additional Outgrants with respect to the Leased Premises. However, any such additional Outgrant shall not be inconsistent with the Lessee's quiet use and enjoyment of the Leased Premises under this Lease. The proposed grant of any new Outgrant shall be coordinated with the Lessee.

2.2. The holders of such Outgrants, present and future, shall have reasonable rights of ingress and egress over the Leased Premises in order to carry out the purpose of the Outgrant. These rights may also be exercised by workers engaged in the construction, installation, maintenance, operation, repair or replacement of facilities located on the Outgrants and by any Federal, state or local official engaged in the official inspection thereof.

3. CONDITION OF LEASED PREMISES

3.1. The Lessee agrees that it has inspected, and knows and accepts the condition and state of repair of, the Leased Premises. Except as otherwise provided in Condition 10 (Environmental Protection and Natural Resources), it is understood and agreed that they are leased in an "as is," "where is" condition without any representation or warranty by the Air Force concerning their condition. The Lessee acknowledges that the Air Force has not made any representation or warranty concerning the condition and state of repair of the Leased Premises or assumed any obligation or made any agreement or promise to alter, improve, adapt, or repair them which has not been fully set forth in this Lease.

3.2. An environmental site assessment ("ESA"), signed by the respective representatives of the Parties, is attached hereto as Exhibit C. The ESA sets forth those environmental conditions and matters on and affecting the Leased Premises on the Term Beginning Date, as determined from the records and analyses reflected therein. A similar ESA of the Leased Premises will be prepared, signed, and attached hereto as Exhibit C-1 after the expiration or earlier termination of the Lease. This ESA will document the environmental conditions and matters on and affecting the Leased Premises on the ending date of the Lease as determined from the records and analyses reflected therein.

4. USE OF LEASED PREMISES

4.1. The sole purpose for which the Leased Premises and improvements thereon may be used, in the absence of the prior written approval of the Government for

any other use, is for design, construction, establishment, operation and maintenance of a PV Array to supply and deliver renewable (solar power) utility service to Nellis AFB and directly related activities, such as a staging ground for construction equipment.

4.1.1. In the event the Government shall cease purchasing electricity generated by the PV Array, the Lessee shall continue its photovoltaic operations on the Leased Premises as provided under the Lease, subject to Conditions 4.1 and 6.4, and provided that the Lessee is not in default of any of its obligations under the Lease (including the Operating Agreement identified in Condition 5.1 below).

4.1.2. The Government's approval for use of the Leased Premises and improvements thereon for any purpose other than the PV Array to supply and deliver renewable (solar power) utility service to Nellis AFB as provided in Condition 4.1 above, may be withheld in its sole and absolute discretion.

4.2. The Lessee, at its expense and at no expense to the Government, shall construct and erect on the Leased Premises all facilities and other improvements needed to establish, operate and maintain the PV Array to supply and deliver renewable (solar power) utility service to Nellis AFB, as provided in Condition 17 of the Lease.

4.3. The Lessee recognizes that environmental conditions on portions of the Leased Premises require that certain restrictions be imposed on the use of such portions and agrees that the use of the Leased Premises is subject to the restrictions contained in Conditions 10, 17, and 24 below.

4.4. The Lessee shall use the Leased Premises for the purposes specified in this Condition 4. In the absence of Government written approval for another use, the abandonment or discontinued use of the PV Array or other failure to use the Leased Premises for the supply and delivery of renewable (solar power) utility service to Nellis AFB for any period of two (2) or more consecutive years shall be deemed to be and constitute a default by Lessee, and the Government shall have the right to terminate the Lease for such default under Condition 7.1. Government-directed or Government approved suspensions shall not be considered as abandonment or discontinued use of the PV Array or other failure to use the Leased Premises to supply and deliver renewable (solar power) utility service to Nellis AFB.

5. OTHER AGREEMENTS

5.1. A companion Operating Agreement to the Lease, attached hereto as Exhibit D, sets forth detailed procedures and requirements to be followed by the Lessee in operating and maintaining the Leased Premises. In the event of any amendment of the Operating Agreement, the amended Operating Agreement will be deemed to be substituted for (and incorporated into this Lease under Condition 33) in lieu of the existing one. In the event of any conflict, inconsistency or question of controlling document between any provisions of the Operating Agreement, as it presently exists or

may be amended in the future, and any provisions of the Lease, the provisions of the Lease will control.

5.2. The Government and the Lessee have entered into a certain related utility contract for an indefinite term and may, during the existence of the Lease, enter into other related utility contracts. (These related contracts shall be referred to collectively as "Government Utility Contracts.")

5.2.1. In the event of any conflict, inconsistency or question of controlling document between any provisions of the Lease (including the Operating Agreement) and any provisions of a Government Utility Contract with respect to matters arising under the Lease (including environmental liabilities), the provisions of the Lease will control.

5.2.2. The Government Utility Contract in effect on the Term Beginning Date is: Air Force Contract No. _____, which provides for the supply and delivery of renewable (solar power) utility services to Nellis AFB for an indefinite term, beginning on _____, 200__.

5.3. Environmental liabilities under this Lease as between the Parties are addressed exclusively in the Lease.

5.4. Within _____ (__) days of the Term Beginning Date, the Lessee shall enter into an interconnect agreement with Nevada Power, which identifies the Nevada Power power distribution system interconnection requirements (the "Interconnect Agreement").

5.4.1. The Lessee shall comply with all applicable provisions of the Interconnect Agreement, as it may be amended in the future and any successor agreement.

5.4.2. A fully executed copy of the Interconnect Agreement shall be provided by the Lessee and attached hereto as Exhibit E.

6. CONSIDERATION

6.1. The Lessee shall pay to the Government cash rent in the nominal amount of TEN DOLLARS (\$10.00) for the Term, the receipt and sufficiency of which is hereby acknowledged, and provide other good and valuable consideration as hereinafter provided herein.

6.2. Lessee shall sell to the Air Force for use at Nellis AFB the 18 MW of photovoltaic-generated electricity from the PV Array at the negotiated rate of ____ (__) cents per MW.

6.3. Lessee also shall provide as other good and valuable consideration maintenance, protection, repair and restoration of the Leased Premises by and at the expense of the Lessee in accordance with the Lease.

6.4. Notwithstanding Condition 6.1 and anything else to the contrary in the Lease, if at any time during the Term, the Air Force shall cease purchasing the electricity generated by the PV Array, the Lessee shall, at the option of the Government, exercisable in its sole and absolute discretion, pay cash rent to the Government on the following terms and conditions:

6.4.1. Amount of Rent. Rent shall be due in an amount equal to the Fair Market Rental Value of the Leased Premises (as that term is defined below in Condition 6.4.1.1) as the same is adjusted at the end of each three (3)-year period during the remainder of the Term ("Rental Adjustment Date").

6.4.1.1. The term, "Fair Market Rental Value," means the fair market rental value of the Leased Premises, exclusive of those improvements constructed or erected thereon by the Lessee, as determined by a Government appraisal performed within ninety (90) days of the date the Government exercises its option under Condition 6.4 or any Rental Adjustment Date, as applicable.

6.4.1.2. Rent payable by the Lessee to the Government following a Rental Adjustment date shall in no event be less than the rent payable by the Lessee to the Government during the last lease year prior to such Rental Adjustment Date.

6.4.2. Rent Payments. Any rent required to be paid by the Lessee hereunder shall be payable in twelve (12) equal monthly installments on the first (1st) day of each and every calendar month during the remainder of the Term, beginning with the first (1st) month in which the Government exercises its option under Condition 6.4. If the Government exercises its option on a day other than the first day of a calendar month, the first monthly installment of rent payable by the Lessee shall be prorated accordingly.

6.4.2.1. All rent due from the Lessee shall be paid in lawful money of the United States of America without deduction or offset, prior notice or demand, to the Treasurer of the United States of America and forwarded directly to the Installation Commander, 99th ABW/CC, 4430 Grissom Avenue, Suite 110, Nellis AFB, NV 89191 (the "Commander"), or such other official as the Commander shall designate.

6.4.2.2. Any amount due from the Lessee to the Government under this Lease which is past due for ten (10) days or more shall bear interest at the rate prescribed by the Secretary of the Treasury for amounts past due to the Federal Government. Interest shall accrue beginning on the day after the rent payment is due and end on the day payment is received by the Government.

6.5. The foregoing cash rent and other consideration has been determined by the Air Force to be no less than the fair market value of the leased interest.

6.6. Lessee shall pay to the Government on demand any sum that may reasonably have to be expended by the Government after the expiration or termination of this Lease in restoring the Leased Premises to the condition required by Condition 9.

7. DEFAULT AND TERMINATION

7.1. The following shall constitute a default and breach of this Lease by the Lessee: The failure to comply with any provision of this Lease, where such failure to comply continues for thirty (30) calendar days after delivery of written notice thereof by the Government to the Lessee. If, however, the time required to return to compliance exceeds the thirty (30) day period, the Lessee shall not be deemed to be in default and breach if the Lessee within such period shall begin the actions necessary to bring it into compliance with the Lease in accordance with a compliance schedule approved by the Government, which approval shall not be unreasonably withheld.

7.2. No default or breach shall be deemed to have occurred for any period of time during which the Parties are attempting to resolve a dispute, pursuant to the procedures provided for in Condition 21, in relation to the actions or inactions which are the subject of the alleged default or breach. If, pursuant to dispute resolution, the default or breach is determined to have occurred, the Lessee's period for cure shall not begin until the day after the final decision on the dispute is issued.

7.3. This Lease may be terminated as provided below in this Condition 7.3. No money or other consideration paid by the Lessee or which may be due the Government up to the effective date of termination will be refunded or waived, as the case may be. The right to terminate the Lease by the Government may be exercised only at the level of Deputy Assistant Secretary of the Air Force (Installations) or higher.

7.3.1. The Government may terminate this Lease as to all or any part of the Leased Premises in the event of any default and breach of the Lease by the Lessee at any time after expiration of the cure period provided for in Condition 7.1 upon written notice of the termination ("Termination Notice for Default and Breach") to the Lessee. The Termination Notice for Default and Breach shall be effective as of a day to be specified therein, which shall be at least five (5) but not more than thirty (30) calendar days after its receipt by the Lessee.

8. TAXES

8.1. Lessee shall pay to the proper authority, when and as the same become due and payable, all taxes, assessments, and similar charges which, at any time during the term of this Lease may be imposed upon the Lessee with respect to the Leased Premises.

9. SURRENDER OF LEASED PREMISES

9.1. On or before the date of expiration of the Lease ("Lease Expiration Date") or the effective date of any notice of termination ("Lease Termination Date") under Condition 7 above, as applicable (collectively, "Term Ending Date"), the Lessee shall terminate its operations on the Leased Premises and vacate and surrender them to the Government.

9.1.1. In the event the Lease is terminated pursuant to Conditions 7.3.1, the Lessee shall at its sole cost and expense, within ninety (90) calendar days after the effective date of the Termination Notice for Default and Breach (or such longer period of time as shall be mutually agreed upon by the Parties), remove the Lessee Improvements and its other property (both real and personal) from the Leased Premises and restore them to a condition substantially similar to their condition on the Term Beginning Date (normal wear and tear excepted), subject to Conditions 10, 17, and 22 below. If the Lessee shall fail, refuse, or neglect to remove the Lessee Improvements and its other property and restore the Leased Premises within the appointed time, the Government, after notice to the Lessee, may cause the Lessee Improvements and the Lessee's other property to be removed and/or destroyed and the Leased Premises to be restored pursuant to the requirements of this Lease at the expense of the Lessee and no claim for damages against the Government, its officers, employees, agents or contractors shall be created by or made on account of such removal and/or destruction and restoration work. Notwithstanding the foregoing, if the Lease Termination Date is within twelve (12) or less months of the Lease Expiration Date, or upon the Lessee's written request if the Lease Termination Date occurs earlier, the Government may, at its option and subject to the agreement of the Lessee, Condition 10.7 and Congressional authorization, if required, accept the Lessee Improvements in lieu of such removal and restoration.

9.1.2. Upon expiration of the Lease, the Lessee shall at its sole cost and expense, within ninety (90) days after the Lease Expiration Date (or such longer period of time as shall be mutually agreed upon by the Parties), remove the Lessee Improvements and its other property (both real and personal) from the Leased Premises and restore them to a condition substantially similar to their condition on the Term Beginning Date (normal wear and tear excepted), subject to Conditions 10, 17, and 22 below. The Government may, at its option and after notice to the Lessee and subject to Condition 10.7 and Congressional authorization, if required, accept the Lessee Improvements in lieu of such removal and restoration. If the Lessee shall fail, refuse, or neglect to remove the Lessee Improvements and its other property and restore the Leased Premises within the appointed time, the Government, after notice to the Lessee, may cause the Lessee Improvements and the Lessee's other property to be removed and/or destroyed and the Leased Premises to be restored pursuant to the requirements of this Lease at the expense of the Lessee and no claim for damages against the Government, its officers, employees, agents or contractors shall be created by or made on account of such removal and/or destruction and restoration work.

9.2. The Government shall have a reasonable time, extending until the end of the next annual session of the Congress, to obtain any Congressional authorization that by law may be needed to exercise the Government's right to acquire the Lessee Improvements under Conditions 9.1.1 and 9.1.2 above.

9.3. During the period prior to surrender, all obligations assumed by the Lessee under this Lease shall remain in full force and effect.

10. ENVIRONMENTAL PROTECTION AND NATURAL RESOURCES

10.1. As used throughout this Lease, the following terms shall have the meanings set forth below:

10.1.1. "Environmental Laws" means, among other requirements, all Federal, state and local statutes, ordinances, regulations, rules, and other regulatory requirements and standards relating to the regulation and protection of human health, safety, and the environment.

10.1.2. "Environmental Response Action" means, without limitation, any 'response action,' including 'removal' and 'remedial' action, within the meaning of the Comprehensive Environmental Response, Compensation, and Liability Act, 42 U.S.C.A. 9601, *et seq.* (CERCLA); any 'corrective action' within the meaning of the Resource Conservation and Recovery Act, 42 U.S.C.A. 6901, *et seq.* (RCRA); and any other investigation, analytical service, remedial or clean-up action under any other Environmental Laws.

10.1.3. "Hazardous Materials" includes, without limitation, 'hazardous substances,' 'pollutants' and 'contaminants' within the meaning of CERCLA, 'hazardous waste' within the meaning of RCRA, 'acutely hazardous waste,' 'radioactive waste,' 'toxic substances,' 'pollutants' or 'contaminants' or any other term intended to define or classify substances by reason of properties harmful to human health or the environment under any applicable Environmental Laws. The term includes crude oil, any fraction thereof, or refined petroleum products such as oil, gasoline, or other petroleum-based fuels; asbestos; lead; polychlorinated biphenyl; radioactive materials; and radon.

10.1.4. "Occupancy Date" means the date the Government delivers possession of the Leased Premises to Lessee.

10.1.5. "Pre-existing Environmental Contamination" means the presence of any Hazardous Materials at, on or under the Leased Premises prior to the Occupancy Date, except for asbestos and lead-based paint subject to Conditions 10 and 24.4.

10.2. The Lessee shall comply at its sole cost and expense with all Environmental Laws that are or may become applicable to the Lessee's activities on the Leased Premises.

10.3. The Lessee shall obtain at its sole cost and expense any permits required by law for its operations under the Lease, independent of any existing permits.

10.4. The Government's rights under this Lease specifically include the right of Government officials to inspect the Leased Premises, as provided under Condition 13, for compliance with Environmental Laws, whether or not the Government is responsible for enforcing them. Such inspections are without prejudice to the right of duly constituted enforcement officials to make such inspections.

10.5. Except as provided in Condition 10.6 below, the Government is not responsible for any handling, abatement, removal, or containment of asbestos or asbestos-containing material (collectively, "ACM"). The Lessee shall be responsible for and abate at its sole cost and expense all ACM which during the term of this Lease becomes damaged or deteriorates to the extent that it creates a potential source of airborne fibers, as a consequence of the passage of time or of the Lessee's or any sublessee's activities on the Leased Premises during the existence of the Lease, including in the event of any emergency ("Future Damaged or Deteriorated ACM"). The Lessee may choose the most economical means of abating any such Future Damaged or Deteriorated ACM, which may include removal or containment, or a combination of removal and containment.

10.5.1. The Lessee shall be responsible for monitoring the condition of any ACM on the Leased Premises for deterioration or damage and accomplishing repairs pursuant to the applicable conditions of this Lease. The Lessee shall notify the Government as soon as practicable of any emergency ACM responses.

10.5.2. If the Lessee intends to make any Alterations (as defined in Condition 17.1) that requires the handling, abatement, removal, or containment of ACM, the Lessee shall incorporate an appropriate asbestos management plan in the Alterations Plans and/or Utility Designs to be submitted to the Commander under Condition 17. The Lessee shall identify the proposed disposal site for the asbestos in the asbestos management plan.

10.6. The Government shall be responsible for the abatement, removal or containment of ACM existing in the Leased Premises prior to the Occupancy Date, as identified in the ECR attached hereto as Exhibit C, when such ACM is damaged or deteriorated to the extent that it creates a potential source of airborne fibers ("Existing Damaged or Deteriorated ACM"). The Government may choose the most economical means of abating any Existing Damaged or Deteriorated ACM, which may include removal or containment, or a combination of removal and containment. Notwithstanding the foregoing, the Lessee, at its option, may assume sole responsibility for and abate, remove or contain such Existing Damaged or Deteriorated ACM at any time at its sole cost and expense. The Lessee shall give the Government fourteen (14) days written notice of its intent to assume such responsibility for and abate, remove or contain the Existing Damaged or Deteriorated ACM. The Lessee may choose the most economical

means of abating any Existing Damaged or Deteriorated ACM, which may include removal or containment, or a combination of removal and containment.

10.7. The Lessee agrees to conduct and finance all Environmental Response Action with respect to any environmental contamination at or from the Leased Premises attributable to the Lessee's operations or activities occurring on or after the Occupancy Date, including any acts or omissions of the Lessee, or its officers, employees, agents, contractors, subcontractors, or any sublessees or licensees, or others who may have been or may be on the Leased Premises at the invitation of any one of them.

10.8. The Lessee shall indemnify, save, and hold harmless the Government from any damages, costs, expenses, liabilities, fines, penalties or Environmental Response Action resulting from releases, discharges, emissions, spills, storage, handling, or disposal of, or any other acts or omissions concerning Hazardous Materials attributable to operations or activities of the Lessee, its officers, employees, agents, contractors, subcontractors or any sublessees or licensees, or others who may have been or may be on the Leased Premises at the invitation of any one of them, which operations or activities occur on or after the Occupancy Date, giving rise to Government liability, civil or criminal, or responsibility under Environmental Laws. The Government will give the Lessee notice of any claim against it covered by this indemnity as soon after learning of it as practicable.

10.8.1. Notwithstanding any other provision of the Lease, the Lessee, as between the Parties, shall not be liable or responsible under this Lease, and has no obligation to indemnify, defend, save, or hold harmless under this Lease with respect to any damage, costs, expenses, liabilities, fines, penalties or Environmental Response Action resulting from releases, discharges, emissions, spills, storage, handling, or disposal of, or any other acts or omissions concerning Hazardous Materials attributable to the operations or activities of the Government (or any of its officers, employees, agents, contractors, subcontractors or any licensees) on any portion of Nellis AFB, including the Leased Premises. The Lessee shall not be liable or responsible under this Lease and has no obligation under this Lease to indemnify or to undertake the defense of any claim, demand or action, whether in existence now or brought in the future, arising out of Pre-Existing Environmental Contamination.

10.8.2. This Condition does not relieve the Lessee of any responsibility, liability or obligation it may have or acquire with regard to third parties or regulatory authorities by operation of law.

10.8.3. This Condition 10.8 shall survive the expiration or termination of the Lease.

10.9. In the event contaminants of the same composition located in the same area of contamination are attributable to both the operations or activities of the Government and the operations or activities of the Lessee occurring on or after the Occupancy Date, responsibility for the contribution of each Party to the cost of any

resulting Environmental Response Action shall be based on the portion of the contamination attributable to the operations or activities of such Party.

10.10. The Lessee expressly acknowledges that it fully understands that some or all of the Environmental Response Action to be undertaken by the Government with respect to the Nellis AFB Installation Restoration Program ("IRP") may at times impact Lessee's quiet use and enjoyment of the Leased Premises. The Lessee agrees that notwithstanding any other provision of the Lease, the Government assumes no liability to the Lessee (or any sublessee) under this Lease should implementation of the Nellis AFB IRP or other Environmental Response Actions, whether required by law, regulatory agencies, the Air Force or the Department of Defense, interfere with the Lessee's (or any sublessee's) quiet use and enjoyment of the Leased Premises. The Lessee shall have no claim under this Lease against the United States or any officer, employee, agent, contractor, subcontractor, or licensee thereof on account of any such interference, whether due to entry, performance of the Environmental Response Action, or exercise of any right with respect to the Nellis AFB IRP or under this Lease or otherwise. The Government shall coordinate any Environmental Response Action at the Leased Premises with representatives designated by the Lessee to the extent practicable as determined in the Government's sole discretion.

10.11. The Lessee agrees to comply with the provisions of any health or safety plan in effect under the Nellis AFB IRP or any hazardous substance or other remediation or response agreement with environmental regulatory authorities during the course of any Environmental Response Action. The Lessee, its officers, employees, agents, contractors, subcontractors or any sublessees or licensees, or others who may have been or may be on the Leased Premises at the invitation of any one of them, shall have no claim on account of such agreement or Environmental Response Action against the United States or any officer, employee, agent, contractor, subcontractor or licensee thereof.

10.12. The Lessee shall not accomplish any treatment, storage or disposal of hazardous waste requiring a permit under RCRA unless the Lessee is in possession of a valid permit issued to it under RCRA. The Lessee shall not treat, store, or dispose of any hazardous waste under, pursuant to, or in reliance upon any permit issued to the Air Force.

10.12.1. The Lessee must provide at its own expense such hazardous waste storage facilities as it may need for storage. Government hazardous waste storage facilities will not be available to the Lessee.

10.12.2. The Lessee shall not use any Air Force accumulation points for hazardous and other wastes or permit its hazardous waste to be commingled with hazardous waste of the Air Force.

10.12.3. As between the Parties, the Lessee shall be liable for any violations of the requirements of this Condition 10.12 by any of its officers, employees,

agents, contractors, subcontractors, sublessees, licensees, or others who may have been or may be on the Leased Premises at the invitation of any one of them. The Lessee shall be liable for the cost of proper disposal of any hazardous waste generated by the Lessee or any of its agents, contractors, subcontractors, sublessees, licensees, or others who may have been or may be on the Leased Premises at the invitation of any one of them in the event of failure to dispose properly of such wastes. The Lessee shall notify the Commander no later than five (5) business days after receipt of a Notice of Violation, a notice of noncompliance, or a warning.

10.13. The Lessee must maintain and make available to the Air Force all records, inspection logs, and manifests that track the generation, handling, storage, treatment and disposal of hazardous waste, as well as all other records required by Environmental Laws. The Air Force reserves the right to inspect, as provided under Condition 13, the Leased Premises, including any building, facility, structure or other improvement on the Leased Premises, and Lessee records for compliance with Environmental Laws. The Lessee will report violations to appropriate regulatory agencies as required by applicable law. The Air Force reserves the right to report violations to appropriate regulatory agencies as required by law if the Lessee fails to report such violations within the required time period. As between the Parties, the Lessee will be liable for the payment of any fines and penalties that may accrue as a result of the actions of the Lessee, its officers, employees, agents, contractors, subcontractors, sublessees, licensees, or others who may have been or may be on the Leased Premises at their invitation or the invitation of any one of them.

10.14. Prior to commencement of operations on the Leased Premises, the Lessee shall submit to the Government a completed and approved plan for responding to hazardous waste, fuel, and other chemical spills. Such plan shall comply with all applicable requirements and shall be updated from time to time as may be required to account for changes in site conditions or comply with applicable requirements and, where required by Environmental Laws, such plan shall be approved by all agencies having regulatory jurisdiction over such plan. The plan shall complement but be independent of Air Force spill prevention and response plans. The Lessee shall not rely on use of Nellis AFB personnel or equipment in execution of its plan. The Lessee shall file a copy of the approved plan and approved amendments thereto with the Commander within fifteen (15) calendar days of approval. Should the Air Force provide any personnel or equipment, whether for initial fire response and/or spill containment or otherwise on request of the Lessee or because the Lessee was not, in the opinion of the Air Force, conducting timely cleanup actions, the Lessee agrees to reimburse the Air Force for its costs in accordance with Condition 10.7 and all applicable laws and regulations.

10.15. Prior to any storage, mixing, or application of pesticides within the meaning of the Federal Insecticide, Fungicide, and Rodenticide Act ("FIFRA"), the Lessee shall prepare and comply with a plan for storage, mixing and application of pesticides ("Pesticide Management Plan") in compliance with Environmental Laws.

10.16. The Lessee will not discharge industrial wastewater under the authority of any NPDES permit, pretreatment permit, or any other permit issued to Nellis AFB. If the Lessee discharges wastewater to a publicly-owned treatment works, the Lessee must submit an application for its discharge ("Pretreatment Permit Application") as required by Environmental Laws.]

10.17. The Lessee must notify the Commander of Lessee's intent to possess, store, or use any source or by-product materials, as those terms are defined under the Atomic Energy Act and its implementing regulations; of Lessee's intent to possess, use, or store radium; and of Lessee's intent to possess or use any equipment producing ionizing radiation and subject to specific licensing requirements or other individual regulations, at least sixty (60) calendar days prior to the entry of such materials or equipment upon Nellis AFB. Upon notification, the Commander may impose such requirements, including prohibition of possession, use, or storage, as deemed necessary to adequately protect human health and the environment. Thereafter, the Lessee must notify the Commander of the presence of all licensed or licensable source or by-product materials, of the presence of all radium, and of the presence of all equipment producing ionizing radiation and subject to specific licensing requirements or other individual regulation; provided, however, that the Lessee need not make either of the above notifications to the Commander with respect to source and by-product material which is exempt from regulation under the Atomic Energy Act. The Lessee shall not use, own, possess or allow the presence of special nuclear material on the Leased Premises without prior notice to and written approval of the Commander.

10.18. The Government and its officers, employees, agents, contractors, subcontractors and any licensees shall have the right, upon reasonable notice to the Lessee (and any sublessee), to enter upon the Leased Premises for the purposes enumerated below in this Condition.

10.18.1. To conduct investigations and surveys, including, where necessary, drilling, soil and water sampling, testpitting, testing soil borings and other activities related to the Nellis AFB IRP;

10.18.2. To inspect field activities of the Government and its contractors and subcontractors in implementing the Nellis AFB IRP;

10.18.3. To conduct any test or survey related to the implementation of the Nellis AFB IRP, or to environmental conditions at the Leased Premises or to verify any data submitted to the United States Environmental Protection Agency (EPA), state or local environmental agencies by the Government relating to such conditions;

10.18.4. To construct, operate, maintain or undertake any other response or remedial action as required or necessary under the Nellis AFB IRP, including, but not limited to, monitoring wells, pumping wells and treatment facilities.

10.19. The Lessee shall protect natural resources.

10.19.1. The Lessee shall be liable for any damages to natural resources (including any requirement to restore damaged resources as provided in Condition 11.2) where such damage is attributable to the operations or activities of the Lessee occurring on or after the Occupancy Date.

10.19.2. The Lessee shall be liable for any natural resource damages as a result of a release or threatened release of hazardous substances under CERCLA or other applicable Environmental Laws attributable to the operations or activities of the Lessee occurring on or after the Occupancy Date.

10.20. The Lessee shall not remove or disturb, or cause or permit to be removed or disturbed, any historical, archeological, architectural or other cultural artifacts, relics, remains or objects of antiquity. In the event such items are discovered on the Leased Premises, the Lessee shall immediately notify the Commander and protect the site and the material from further disturbance until the Commander gives clearance to proceed.

10.21. The Lessee will provide the Government with copies of all documents pertaining to the Leased Premises submitted to or received from regulatory agencies. The Lessee shall also provide the Government with copies of all final Lessee-sponsored environmental surveys, studies, abatement or mitigation plans pertaining to the Leased Premises. The Lessee shall provide such copies within ten (10) calendar days of receipt or completion. The Government shall provide reasonable access to all Government-sponsored environmental surveys, abatement or mitigation plans that pertain to the Leased Premises.

11. MAINTENANCE OF THE LEASED PREMISES

11.1. The Lessee, at no expense to the Government, shall at all times after delivery of possession of the Leased Premises protect, preserve, and maintain all portions of the Leased Premises, including all improvements, in good order and condition. The Lessee shall at all times exercise due diligence in protecting the Leased Premises, including all improvements, against damage or destruction by fire and other causes, subject to the applicable provisions of Conditions 6, 10, 15, 17, and 24.

11.1.1. The Lessee shall be responsible for all aspects of maintaining the PV Array, including but not limited to cleaning the arrays, replacing broken or worn out system components, performing maintenance in accordance with equipment manufacturer recommendations and ensuring that every part of the array is operating according to design, producing the maximum amount of power possible and free of power quality issues. To the maximum extent possible, Lessee shall schedule maintenance and repair of the array at times when output of the array is at its lowest point such that charges for power paid by Nellis AFB to Nevada Power Company are minimized.

11.1.2. Lessee will perform normal housekeeping functions inside and outside its facilities and job site locations, including sweeping, mopping, dusting, disposal of accumulated waste materials and rubbish and other operations necessary to present a neat appearance. All rubbish and waste materials shall be disposed of properly. Lessee shall store all supplies and equipment only at approved storage area so as to preclude theft or damage and maintain the site in a neat and orderly manner.

11.1.3. Lessee will ensure that loose debris on trucks leaving the site are to be loaded in a manner that will prevent dropping of materials on the streets and shall have a suitable cover, such as a tarpaulin, over the load before entering surrounding streets. Lessee shall be responsible for promptly cleaning up any materials that fall from trucks.

11.1.4. The Lessee shall, at all times, maintain in good condition all parking areas, roads, access drives, and appurtenant drainage thereto within the Leased Premises, and shall keep them free of debris and obstructions of any kind.

11.1.5. The Lessee shall maintain in good condition and safely operate all machinery and equipment used on the Leased Premises.

11.2. Any real or personal property of the Government (including natural resources) which is damaged or destroyed by the Lessee incident to the Lessee's use and occupation of the Leased Premises shall be promptly repaired or replaced by the Lessee to the condition it was prior to said damage or destruction as reasonably determined by the Government. If the Lessee shall fail or refuse to repair or replace the property that was damaged or destroyed by the Lessee incident to Lessee's use and occupation of the Leased Premises, the Lessee shall, if so required by the Government, pay to the Government money in an amount sufficient to compensate for the loss sustained by the Government by reason of damage or destruction of Government property, including natural resources. Condition 10.19.2 governs the Lessee's responsibilities in connection with natural resource damages caused by a release or threatened release of a hazardous substance under CERCLA or other applicable Environmental Laws.

12. RULES AND REGULATIONS

12.1. Use and occupation of the Leased Premises shall be subject to the general supervision and approval of the Commander and to such reasonable rules and regulations as the Commander may prescribe from time to time.

13. ACCESS AND INSPECTION

13.1. Any agency of the United States, its officers, agents, employees, and contractors, may enter upon the Leased Premises, without escort, at all times for any purposes not inconsistent with Lessee's quiet use and enjoyment of them under this Lease, including but not limited to the purpose of inspection. The Government normally

will enter the Leased Premises during regular business hours and give the Lessee at least twenty-four (24) hours prior notice of its intention to do so, unless it determines entry at other times or without notice or both is required for safety, environmental, operations, or security purposes. The Lessee and any subcontractors, sublessees, assignees, licensees, or invitees shall have no claim on account of such entries against the United States or any officer, agent, employee, contractor, or subcontractor thereof.

14. GENERAL INDEMNIFICATION BY LESSEE

14.1. The Government shall not be responsible for damages to property or injuries or death to persons which may arise from or be attributable or incident to the condition or state of repair of the Leased Premises, or the use and occupation of them, or for damages to the property of the Lessee, or for damages to the property or injuries or death to the person of the Lessee's officers, agents, servants or employees, or others who may be on the Leased Premises at the invitation of any one of them. Nothing in this Condition 14.1 shall be construed to diminish or otherwise affect the duties and obligations of the Parties under Condition 10.

14.2. Except as otherwise provided in Condition 10, the Lessee agrees to assume all risks of loss or damage to property and injury or death to persons by reason of or incident to the possession and/or use of the Leased Premises, or the activities conducted by the Lessee under this Lease. The Lessee expressly waives all claims against the Government (except claims arising from the Government's willful misconduct) for any such loss, damage, personal injury or death caused by or occurring as a consequence of such possession and/or use of the Leased Premises or the conduct of activities or the performance of responsibilities under this Lease. The Lessee further agrees to indemnify, save, and hold harmless the Government, its officers, agents and employees, from and against all suits, claims, demands or actions, liabilities, judgments, costs and attorneys' fees arising out of, or in any manner predicated upon personal injury, death or property damage resulting from, related to, caused by or arising out of the possession and/or use of the Leased Premises or any activities conducted or services furnished in connection with or pursuant to this Lease. The agreements contained in the preceding sentence do not extend to claims for damages caused by the willful misconduct of officers, agents or employees of the United States. The Government will give the Lessee notice of any claim against it covered by this indemnity as soon after learning of it as practicable.

15. INSURANCE

15.1. Except as otherwise provided in Condition 10, the Lessee shall in any event and without prejudice to any other rights of the Government bear all risk of loss or damage or destruction to the Leased Premises, including any buildings, improvements, fixtures or other property thereon, arising from any causes whatsoever, with or without fault by the Government.

15.2. The Lessee, at no expense to the Government, shall carry and maintain the insurance required below in this Condition 15.2 during the entire period this Lease shall be in effect, subject to Condition 15.5 below.

15.2.1. The insurance required to be carried and maintained by the Lessee shall include property insurance coverage against loss or damage by fire and lightning and against loss or damage or other risks embraced by coverage of the type now known as the broad form of extended coverage (including but not limited to riot and civil commotion, vandalism, and malicious mischief) in amounts to provide the following coverage:

15.2.1.1. For any buildings, building improvements, improvements to the land, and personal property on the Leased Premises, other than any Lessee Improvements, coverage in an amount that is not less than One Hundred Percent (100%) of the full insurable value of the buildings, building improvements, improvements to the land and personal property. For purposes of this Condition "insurable value" means "actual cash value" or repair or replacement cost, whichever will apply under the Lessee's policy.

15.2.1.2. For Lessee Improvements, an amount, as reasonably determined by the Lessee that will provide appropriate coverage for the Lessee Improvements.

15.2.1.3. Insurance coverage under Condition 15.2.1 shall be adequate for restoration of the property as nearly as possible to the condition that existed immediately prior to the loss or damage.

15.2.2. The insurance required to be carried and maintained by the Lessee shall also include comprehensive general liability insurance on an "occurrence basis" against claims for "personal injury," including without limitation, bodily injury, death or property damage, occurring upon, in or about the Leased Premises including any buildings thereon and adjoining sidewalks, streets, and passageways. Such insurance shall afford immediate minimum protection at the time of the Term Beginning Date, and at all times during the term of this Lease, with minimum limits of liability not less than _____ MILLION DOLLARS (\$____,000,000) in the event of bodily injury and death to any one or more persons per occurrence, and not less than _____ MILLION DOLLARS (\$____,000,000) for property damage per occurrence. Such insurance also shall include coverage against liability for bodily injury and property damage arising out of the acts or omissions by or on behalf of any other person or organization, or involving any owned, non-owned, leased or hired automotive equipment in connection with the Lessee's activities. The insurance carried and maintained by the Lessee also shall provide environmental coverage to protect the Government from any damage and liability for which the Lessee is liable or responsible or agrees to hold harmless and indemnify the Government under the Lease with minimum limits of liability in amounts approved from time to time by the Government, but not less than _____ MILLION DOLLARS (\$____,000,000) for each of bodily injury, property damage and cleanup costs,

as appropriate. The coverage for the foregoing damages, costs, expenses, liabilities relating to the environment may be collectively referred to as "environmental liability coverage insurance." The insurance carried and maintained by the Lessee pursuant to this Condition shall provide coverage to protect the Government from any damage and liability for which the Lessee is liable or responsible or agrees to hold harmless and indemnify the Government under the Lease.

15.2.3. If and to the extent required by law, the insurance required to be carried and maintained by the Lessee shall also include workers' compensation and employer's liability or similar insurance in form and amounts required by law.

15.3. Subject to Condition 15.5, during the entire period this Lease shall be in effect, Lessee shall either carry and maintain at its expense or require any contractor performing work on the Leased Premises to carry and maintain at no expense to the Government the insurance required below:

15.3.1. The broad form of extended coverage insurance provided for in Condition 15.2.1 above shall be maintained for the limits specified thereunder and shall provide coverage for the mutual benefit of the Government and Lessee as additional insureds in connection with any construction or other work permitted pursuant to this Lease.

15.3.2. Fire and any other applicable insurance provided for in this Condition 15 which, if not then covered under the provisions of existing policies, shall be covered by special endorsement thereto in respect to any alterations (as defined in Condition 17.1), including all materials and equipment therefor incorporated in, on or about the Leased Premises (including excavations, foundations, and footings) under a broad form all risks builder's risk completed value form or equivalent thereof; and

15.3.3. Workers' compensation or similar insurance in form and amounts required by law, if and to the extent required by law.

15.4. All policies of insurance which this Lease requires the Lessee to carry and maintain or cause to be carried or maintained pursuant to this Condition 15 shall be effected under valid and enforceable policies issued by insurers of recognized responsibility. All insurance policies or certificates issued by the respective insurers for the comprehensive general liability coverage insurance, for the environmental liability coverage insurance, and for the broad form of extended coverage insurance provided for above in this Condition shall be for the mutual benefit of the Government and the Lessee and will name the Government as an additional insured. Each such policy shall provide that any losses shall be payable notwithstanding any act or failure to act or negligence of the Lessee or the Government or any other person (not including willful misconduct); provide that no cancellation, reduction in amount, or material change in coverage thereof shall be effective until at least thirty (30) calendar days after receipt by the Government of written notice thereof; provide that the insurer shall have no right of subrogation against the Government; and be reasonably satisfactory to the Government

in all other respects. In no circumstances will the Lessee be entitled to assign to any third party rights of action that the Lessee may have against the Government. Notwithstanding the foregoing, any cancellation of insurance coverage based on nonpayment of the premium shall be effective upon ten (10) calendar days' written notice to the Government. The Lessee understands and agrees that cancellation of any insurance coverage required to be carried and maintained by the Lessee under this Condition 15 will constitute a failure to comply with the terms of the Lease, and the Government shall have the right to terminate the Lease pursuant to Condition 7 upon receipt of any such cancellation notice, but only if the Lessee fails to cure such noncompliance to the extent allowed under Condition 7.

15.5. Except as provided otherwise in Condition 15.5.1, the Lessee shall make available for review by the Government at such time and place convenient to the Government as mutually agreed between the Parties upon execution of this Lease (and thereafter not less than fifteen (15) calendar days prior to the expiration date of each policy furnished pursuant to this Condition 15) each policy of insurance required by the Lease as soon as each such policy is made available by the insurer, or a certificate or certificates of insurance documenting the issuance of the insurance required by the Lease, or both. A review of the Lessee's insurance policies under the terms of the Support Agreement shall satisfy the requirements of this Condition 15.5.

15.5.1. Notwithstanding the foregoing, the Lessee shall make available for review by the Government each policy of insurance required by Conditions 15.2.1, 15.3.1, and the policy of environmental liability coverage insurance required by Condition 15.2.2 or provide a certificate or certificates of insurance documenting the issuance of the foregoing insurance, or both, at the Government's option, not later than sixty (60) calendar days after the Term Beginning Date.

15.6. In the event that any item or part of the Leased Premises shall be damaged (except *de minimis* damage) or destroyed, the risk of which is assumed by the Lessee under Condition 15.1 above ("Damaged or Destroyed Property"), the Lessee shall promptly give notice thereof to the Government. The Lessee shall as soon as practicable after the casualty restore such item or part of the Leased Premises and improvements thereon as nearly as possible to the condition which existed immediately prior to such loss or damage, subject to Condition 9 above. All repair and restoration work under this condition shall comply with the provisions of Condition 10, 17, and 24 applicable to Alterations (as defined in Condition 17.1 below).

15.7. The Lessee shall apply and use any proceeds paid under any insurance policy or policies carried and maintained by the Lessee pursuant to this Lease first to satisfy any claims, damages, and costs assessed against the Government, or to restore, repair or replace any Government property damaged or destroyed by the Lessee, or both, as the case may be.

16. COMPLIANCE WITH APPLICABLE LAWS

16.1. Lessee shall at all times during the existence of this Lease promptly observe and comply, at its sole cost and expense, with all Federal, state, interstate, and local laws, rules, regulations, orders, ordinances, and other governmental standards and requirements, which may be applicable to the Leased Premises, including the structures thereon, and the improvements to be constructed or erected by Lessee on them or any part of them, and particularly those provisions concerning the protection of the environment and pollution control and abatement and occupational safety and health, whether the same now are in force, or that may, at any time in the future, be enacted or directed and that are by law then applicable and enforceable against the Leased Premises.

16.2. Lessee shall comply with all applicable State and local laws, ordinances and regulations with regard to construction, sanitation, licenses or permits to do business and all other matters. Lessee shall be responsible for determining whether it is subject to local building codes or building permit requirements, and for compliance with them to the extent they are applicable.

16.3. Lessee's use of the Leased Premises, including construction, demolition, and disposal, use, operation, maintenance and repair shall at a minimum conform to Clark County building codes and supplemental codes and applicable provisions of the regulatory controls and requirements listed in Conditions 16.3.1 and 16.3.2 and any amendments thereto.

16.3.1. 2002 National Electrical Code (NEC), Unified Facilities Criteria (UFC)3-550-03FA DESIGN; Electrical Supply Power and Distribution, National Electric Safety Code (NESC), and other applicable federal, state, and industry standards as applied to the PV Array project.

16.3.2. Occupational Safety and Health Act ("SSHA")

[Note: Delete/add controls and requirements as appropriate.]

16.3.3. In the event of conflict between any of the requirements in Conditions 16.3.1 and 16.3.2, the most stringent shall govern.

16.4. Nothing in this Lease shall be construed to constitute a waiver of Federal Supremacy or Federal sovereign immunity.

16.5. Responsibility for compliance as specified in this Condition 16 rests exclusively with the Lessee. The Air Force assumes no enforcement or supervisory responsibility except with respect to matters committed to its jurisdiction and authority. The Lessee shall be liable for all costs associated with compliance, defense of enforcement actions or suits, payment of fines, penalties, or other sanctions and remedial costs caused by Lessee's use of the Leased Premises or that of its officers,

employees, agents, contractors, subcontractors, or any sublessees or licensees, or other who may have been or may be on the Leased Premises at the invitation of any one of them.

16.6. The Lessee shall have the right to contest by appropriate proceedings diligently conducted in good faith, without cost or expense to the Government, the validity or application of any law, ordinance, order, rule, regulation or requirement of the nature referred to in this Condition. The Air Force shall not be required to join in or assist the Lessee in any such proceedings.

17. CONSTRUCTION AND ALTERATIONS

17.1. The Lessee shall not place, construct or make or permit any sublessees or assigns to place, construct or make any improvements (including the Lessee Improvements), structures, alterations, or additions, to or installations upon or otherwise modify or alter the Leased Premises without the prior written consent of the Government, which shall not be unreasonably withheld or delayed. (All of the activities in the preceding sentence shall be referred to cumulatively as "Alterations." The Parties expressly agree that the foregoing term, "Alterations," includes the Lessee Improvements and all activities necessary to accomplish them.)

17.1.1. Government consent to Alterations may include a requirement to provide the Government with a performance and payment bond, or similar financial assurances, satisfactory to the Government in all respects and other requirements deemed necessary to protect the interests of the Government. Any Alterations in the proximity of operable units or sites that are part of a Nellis AFB IRP site require the prior written approval of the Commander. Such approval shall not be unreasonably withheld or delayed.

17.1.2. All plans for Alterations pursuant to Condition 17.1 above (Alterations Plans) must comply with the provisions of Conditions 10 and 24, be approved by the Government before the commencement of any construction project. In addition, the designs for any Lessee connections to the Nellis AFB's utilities ("Utility Designs") shall comply with applicable State or local construction standards, or in the absence of any, with Department of Defense/Air Force (DoD/AF) construction standards and be subject to review and approval by the Commander.

17.1.2.1. Alterations Plans and Utility Designs must include a time schedule for completion of the Alterations or utility connection.

17.1.2.2. Lessee shall submit any Alterations Plans and Utility Designs to the Commander for approval, or such other official as the Commander shall designate. Any additional information needed by the Government to complete its review shall be provided promptly by the Lessee upon receipt of any such Government request. The Government shall have the right to approve or reject any or all Alterations Plans and Utility Designs.

17.1.3. The Government review process for either a construction project or a utility connection will be completed within twenty-one (21) days after receipt of all plans and specifications required by the Government for its review. In the event problems are detected during the review, immediate notice will be provided by telephone to the Lessee or its representative designated in writing for the purpose. Approval will not be unreasonably withheld.

17.1.4. The Lessee shall not proceed with excavating, demolition, or construction until it receives written notice from the Government that the Alterations Plans and/or Utility Designs are acceptable to the Government ("Acceptance of Plans and Designs Notice").

17.2. The Lessee agrees that the plans for any Alterations that may impede or impair any activities under the Nellis AFB IRP will include a detailed description, to the extent known, of the effect such planned Alterations may have with respect to site soil and groundwater conditions and cleanup efforts contemplated under the Nellis AFB IRP.

17.3. All Alterations shall be in accordance with the approved Alterations Plans and Utility Designs and without cost to the Government.

17.4. The Lessee shall not dispose or place, or allow any disposal or placement, of excavated material except in approved areas and with the express written consent of the Commander, which shall not be unreasonably withheld or delayed.

17.5. The Lessee understands and agrees that this Lease is subject to and conditioned on the Lessee constructing, and completing the Lessee Improvements and operating and maintaining them as a PV Array to supply and deliver renewable (solar power) utility service exclusively to Nellis AFB. It is specifically understood that (i) the construction and erection of the Lessee Improvements is a private undertaking; (ii) title to the Lessee Improvements shall vest in the Lessee and be subject to the provisions of Condition 9 and all other terms and conditions of this Lease; and (iii) the Government's sole and exclusive interest and liability in this Lease is limited to that of lessor of the land.

17.5.1. The Lessee understands and agrees that once construction of the Lessee Improvements is begun, the Lessee shall prosecute the construction of them to completion with diligence, including any mitigation measures the Lessee is required to perform pursuant to Condition 22.1.

17.5.2. The Lessee shall not be entitled to receive from the Government and the Government shall not be obligated to pay to the Lessee any monetary consideration for construction or erection of the Lessee Improvements on the Leased Premises.

17.5.3. The Lessee shall, on the Term Beginning Date, or such later time as the Government may determine is reasonable, submit Alterations Plans and Utility Designs for construction of the Lessee Improvements.

17.6. All matters of ingress, egress, contractor haul routes, or other access on or across Nellis AFB land not included in this Lease shall be coordinated with the Commander. All excavation, demolition and construction activity shall be accomplished during periods (including hours of the day) acceptable to the Commander.

17.7. The Commander is authorized to grant approvals, consents, and waivers under this Condition 17. At the written request of the Lessee, the Deputy Assistant Secretary of the Air Force (Installations) may review any disapproval. Such review is discretionary. A request by the Lessee for review will be submitted to the Commander, who will forward it through channels with comments within fourteen (14) calendar days after receipt of the request.

17.8. The Lessee shall maintain as-built drawings (or their equivalent) when any approved Alterations hereunder are completed. A copy of the updated drawing shall be provided to the Commander within thirty (30) calendar days of completion of any such Alterations in a format approved by the Commander.

17.8.1. The Lessee shall provide to the Government project closeout documentation for all approved Alterations to the Leased Premises, in a format approved by the Commander, to enable the updating of Air Force real property records.

17.8.2. The Lessee shall make available to the Government copies of all maintenance manuals for any machinery and other equipment the Lessee installs on the Leased Premises.

18. UTILITIES AND SERVICES

18.1. The Lessee will be responsible at its sole expense for all utilities, janitorial services, building maintenance, and grounds maintenance for the Leased Premises. The Government shall furnish utilities and services in accordance with the Operating Agreement. The Lessee will pay, in addition to any cash rent required under the Lease, the charges for any utilities and services furnished by the Government which the Lessee may require in connection with its use of the Leased Premises. Utility services will be metered. The Lessee will purchase, install, and maintain all such meters at its own cost and without cost and expense to the Government. The charges and the method of payment for each utility or service will be determined by the appropriate supplier of the utility or service in accordance with applicable laws and regulations, on such basis as the appropriate supplier of the utility or service may establish and which may include a requirement for the installation of adequate connecting and metering equipment at the sole expense of the Lessee. It is expressly understood and agreed that the Government in no way warrants the continued maintenance or adequacy of any utilities or services furnished by it to the Lessee.

18.2. Any purchases of utility services from the Government are subject to Conditions 18.2.1 and 18.2.2 below.

18.2.1. The sale of any utility service by the Government will be in accordance with 10 U.S.C.A. § 2686 and Air Force Instruction 32-1061, as it may be amended from time to time, or any successor instruction or regulation.

18.2.2. The Lessee agrees to enter into a separate contract for each utility service procured under this Condition 18 at rates to be specified in each contract.

19. NOTICES; DEMANDS

19.1. Any notice, demand, order, direction, determination, requirement, consent or approval, request or other communication required or permitted by law or any provision of the Lease to be given or served on either Party shall be in writing and addressed to the Party at the address set forth below, or such other addresses the Party may designate from time to time by notice, and (i) deposited in the United States mail, registered or certified, return receipt requested, postage prepaid, (ii) delivered by an overnight private mail service which provides delivery confirmation such as, without limitation, Federal Express, Airborne or UPS, or (iii) personally delivered at such address.

To Lessee:

To the United States of America:

Deputy Assistant Secretary of the Air Force
(Installations)
1665 Air Force Pentagon
Washington, D.C. 20330-1665

with a copy to:

Installation Commander
99th ABW/CC
4430 Grissom Avenue, Suite 110
Nellis AFB, NV 89191

19.2. Every notice, demand, order, direction, determination, requirement, consent or approval, request or communication delivered as set forth herein shall be deemed received by the addressee on the delivery date or the delivery refusal date shown on the return receipt or the delivery confirmation.

20. ASSIGNMENT, SUBLEASES AND LICENSES

20.1. The Lessee shall neither transfer nor assign this Lease or any interest therein or any property on the Leased Premises, nor sublet the Leased Premises or any part thereof or any property thereon, nor grant any interest, privilege, or license whatsoever in connection with this Lease (collectively, "Assignment or Sublease") without the prior written consent of the Government in each instance, and any such Assignment or Sublease or attempt thereat shall be null and void.

20.2. Consent by the Government to any proposed Assignment or Sublease shall not be unreasonably withheld or delayed, subject to the provisions of Conditions 20.2.1, 20.2.2, 20.2.3 and 20.2.4 below.

20.2.1. Any Assignment or Sublease granted by the Lessee shall be consistent with all of the terms and conditions of the Lease and shall terminate immediately upon the expiration or any earlier termination of the Lease, without any liability on the part of the Government to the Lessee or any assignee or sublessee. Under any assignment permitted by this Condition, the assignee shall be deemed to have assumed all of the obligations of the Lessee under this Lease. No Assignment or Sublease shall relieve the Lessee of any of its obligations hereunder.

20.2.2. The Lessee shall furnish the Government, for its prior written consent, a copy of each agreement of Assignment or Sublease it proposes to execute. Such consent may include the requirement to delete, add or change provisions in the proposed agreement as the Government shall deem necessary to protect its interests. Consent to any Assignment or Sublease shall not be taken or construed to diminish or enlarge any of the rights or obligations of either of the Parties under the Lease. Consent or rejection or any required changes shall be provided within fourteen (14) calendar days of receipt of the proposed agreement.

20.2.3. Any agreement of Assignment or Sublease must provide that any further assignment of the Lease or assignment or further assignment of the sublease, as applicable, requires the prior written consent of the Government in each instance and any such assignment or further assignment or attempt thereat will be null and void; include the provisions set forth in Conditions 10 and 24 of the Lease; and expressly provide that: (i) the assignment or sublease, as applicable, is subject to all of the terms and conditions of the Lease; (ii) the sublease shall terminate on the expiration or earlier termination of the Lease; and (iii) in case of any conflict between any provisions of the Lease and any provisions of the agreement of assignment or sublease, as applicable, the Lease will control.

20.2.4. A copy of the Lease and all exhibits to it must be attached to the agreement of Assignment or Sublease.

21. DISPUTES

21.1. Disputes Valued at Less than \$10,000 (Exclusive of Interest). Except as otherwise provided in this Lease, any dispute between the Government and the Lessee arising under or related to this Lease which the Parties are unable to resolve by negotiation and in which Ten Thousand Dollars (\$10,000.00) (exclusive of interest) or less is at issue shall be decided by the Commander. The Commander shall reduce his or her decision to writing and mail or otherwise furnish a copy to the Lessee. With respect to any such dispute, the Lessee agrees that the decision of the Commander shall be final and conclusive and shall not be appealable or otherwise subject to challenge.

21.2. Disputes Valued at \$10,000 or More (Exclusive of Interest). The Lessee and the Government hereby agree that the following procedures constitute the administrative procedures that must be exhausted before the Lessee or Government may pursue any remedy that is available to it under law.

21.2.1. Any dispute between the Government and the Lessee arising under or related to this Lease which the Parties are unable to resolve by negotiation and in which Ten Thousand Dollars (\$10,000.00) or more (exclusive of interest) is at issue shall be decided by the Commander. The Commander shall reduce his or her decision to writing within sixty (60) days after receipt of a written request for such a decision by the Lessee, or such reasonable time as the Commander may determine, and mail or otherwise furnish a copy to the Lessee. The decision of the Commander ("Decision") shall be final and conclusive unless, within thirty (30) calendar days from the date of receipt of the Decision, the Lessee furnishes the Commander, by certified mail, a written appeal of the Decision addressed to the Secretary of the Air Force ("Secretary").

21.2.2. The Secretary shall render a decision by a date mutually agreed on by the Parties. The decision of the Secretary or his or her authorized representative shall be final unless appealed to a court of competent jurisdiction in a timely manner, consistent with Condition 21.3 below. In connection with any appeal to the Secretary, the Lessee and the Air Force shall be afforded an opportunity to be heard and to offer evidence in support of its appeal.

21.3. Judicial Review. The Lessee or the Air Force, after exhausting the administrative remedies specified in Condition 21.2 above, may:

21.3.1. Pursue any remedy available to it under the law; or

21.3.2. Before or in conjunction with pursuing any remedy which is available to it under law, by mutual agreement, submit the dispute to an alternative

dispute resolution procedure authorized by the Administrative Dispute Resolution Act of 1996, P. L. 104-320 (codified at 5 U.S.C. 571, et seq.).

21.4. The Parties understand and agree that the Government's obligation to make any payment pursuant to this Lease is contingent upon the availability of appropriated funds proper for such payment.

22. SPECIAL PROVISIONS

22.1. The Lessee recognizes that Nellis AFB is an operating military installation and that the Government's military mission has priority and primacy over all other operations on Nellis AFB, including those conducted on premises outleased to others. The Lessee understands and accepts that the priority of conducting Government operations at Nellis AFB, including but not limited to normal base-related operations, the Nellis AFB IRP, Government overflight, surges, exercises, contingencies, inspections and other Air Force operations (collectively, "Government Operations") may at times require delay in, modification or other interruption of the Lessee's operations, including its construction activities. The Government shall, whenever possible, provide advance notice of activities that may impact Lessee's operations and shall coordinate such activities so that any disruption to Lessee's operations is minimized.

22.1.1. The Lessee hereby agrees that in case of any conflict between Government Operations and Lessee's operations, as determined by the Commander in the Commander's sole and absolute discretion, the Lessee will, if the Commander so directs, delay, modify or otherwise interrupt its operations on the Leased Premises, at no cost to the Government under this Lease, to accommodate Government Operations.

22.2.2. The Lessee also understands and accepts that its operations on the Leased Premises may, from time to time, be hampered by temporary restrictions on access, such as identity checks and auto searches by the Air Force. The Lessee understands that the Air Force strictly enforces Federal laws and Air Force regulations concerning controlled substances (drugs).

22.2.3. The Lessee agrees that the Government shall not be liable or responsible under this Lease for any lost time or any costs incurred by the Lessee due to any disruption of its activities on the Leased Premises, regardless of frequency or duration of any such interruptions, including disruptions of its commercial activities, or for any delays in entry, temporary loss of access, barring of individual employees from the base under Federal laws authorizing such actions, limitation or withdrawal of an employee's on-base driving privileges, or any other security action (collectively, "Security Actions") that may cause employees to be late to or unavailable at their work stations, or delay arrival of parts and supplies. The Lessee hereby expressly waives any claims or suits against the Government under this Lease caused by or arising out of the priority of conducting Government Operations, including any Security Actions.

22.2. The Lessee shall not permit gambling on the Leased Premises or install or operate, or permit to be installed or operated on them, any device that is illegal. The Lessee shall not use the Leased Premises or permit them to be used for any illegal business or purpose.

22.3. The Lessee shall not carry on or conduct or permit the carrying on or conduct of on the Leased Premises any activity that would constitute a nuisance.

22.4. The Lessee shall not sell, store or dispense, or permit the sale, storage, or dispensing of beer or other intoxicating liquors on the Leased Premises.

23. GENERAL PROVISIONS

23.1. Covenant against Contingent Fees. The Lessee warrants that no person or agency has been employed or retained to solicit or secure this Lease upon an agreement or understanding for a commission, percentage, brokerage, or contingent fee, excepting bona fide employees or bona fide established commercial agencies maintained by the Lessee for the purpose of securing business. For breach or violation of this warranty, the Government shall have the right to annul this Lease without liability or in its discretion to require the Lessee to pay, in addition to the Lease rental or consideration, the full amount of such commission, percentage, brokerage, or contingent fee.

23.2. Officials Not to Benefit. No Member of or Delegate to the Congress of the United States of America or Resident Commissioner of the United States of America, shall be admitted to any share or part of this Lease or to any benefit to arise therefrom. Nothing, however, herein contained shall be construed to extend to any incorporated company, if this Lease be for the general benefit of such corporation or company.

23.3. Facilities Nondiscrimination. As used in this Condition, the term "facility" means lodgings, stores, shops, restaurants, cafeterias, restrooms, and any other facility of a public nature in any building covered by, or built on land covered by, this Lease.

23.3.1. The Lessee agrees not to discriminate against any person because of race, color, religion, sex, or national origin in furnishing, or by refusing to furnish, to such person or persons the use of any facility, including any and all services, privileges, accommodations, and activities provided on the Leased Premises. This does not require the furnishing to the general public the use of any facility customarily furnished by the Lessee solely to tenants or to Air Force military and civilian personnel, and the guests and invitees of any of them.

23.3.2. The Parties agree that in the event of the Lessee's noncompliance, the Government may take appropriate action to enforce compliance, may terminate this Lease for default and breach as provided in Condition 7 above, or may pursue such other remedies as may be provided by law.

23.4. Gratuities.

23.4.1. The Government may, by written notice to the Lessee, terminate this Lease if, after notice and hearing, the Secretary of the Air Force or a designee determines that the Lessee, or any agent or representative of the Lessee, offered or gave a gratuity (e.g., an entertainment or gift) to any officer, official, or employee of the Government and intended, by the gratuity, to obtain a lease or other agreement or favorable treatment under a lease or other agreement.

23.4.2. The facts supporting this determination may be reviewed by any court having lawful jurisdiction.

23.4.3. In the event this Lease is terminated under Condition 23.4.1 above, the Government shall be entitled to pursue the same remedies against the Lessee as in a breach of the Lease by the Lessee, and in addition to any other damages provided by law, to exemplary damages of not less than three (3) nor more than ten (10) times the costs incurred by the Lessee in giving gratuities to the person concerned, as determined by the Secretary of the Air Force or a designee.

23.4.4. The rights and remedies of the Government provided in this Condition shall not be exclusive and are in addition to any other rights and remedies provided by law or under this Lease.

23.5. No Joint Venture. It is understood and agreed that the only relationship created by this Lease between the Government and the Lessee is that of landlord and tenant. Neither will anything in this Lease render, nor be construed to render, either of the Parties hereto liable to any third party for the debts or obligations of the other party hereto.

23.6. Records and Books of Account. The Lessee agrees that the Comptroller General of the United States or the Auditor General of the United States Air Force or any of their duly authorized representatives shall, until the expiration of three (3) years after the expiration or earlier termination of this Lease, have access to and the right to examine any directly pertinent books, documents, papers, and records of the Lessee involving transactions related to this Lease. The Lessee further agrees that any sublease of the Leased Premises (or any part thereof) will contain a provision to the effect that the Comptroller General of the United States or the Auditor General of the United States Air Force or any of their duly authorized representatives shall, until three (3) years after the expiration or earlier termination of this Lease, have access to and the right to examine any directly pertinent books, documents, papers, and records of the sublessee involving transactions related to the sublease.

23.7. Failure to Insist on Compliance. The failure of either party to insist in any one or more instances, upon strict performance of any of the terms, covenants or conditions of this Lease shall not be construed as a waiver or a relinquishment of their rights to the future performance of any such terms, covenants or conditions. The

obligations of both Parties with respect to such future performance shall continue in full force and effect.

23.8. Counterparts. This Lease may be executed in two (2) counterparts, each of which shall be an original of equal dignity with the other and both of which shall constitute but one and the same instrument.

23.9. Captions. The captions preceding each condition are merely for purposes of identification, convenience, and ease of reference, and will be completely disregarded in the construction of this Lease.

23.10. Personal Pronouns. All personal pronouns used in this Lease, whether used in the masculine, feminine or neuter gender, will include all other genders.

23.11. Entire Agreement. It is expressly agreed that this written instrument, and its exhibits, embodies the entire agreement between the Parties regarding the use of the Leased Premises by the Lessee, and there are no understandings or agreements, verbal or otherwise, between the Parties except as expressly set forth herein. This instrument may only be modified or amended by mutual agreement of the Parties in writing and signed by each of the Parties hereto.

23.12. Several Lessees. If more than one Lessee is named in this Lease, the obligations of the said lessees herein contained shall be joint and several obligations.

24. RESTRICTIONS ON USE OF LEASED PREMISES

24.1. The Lessee shall not install any new drinking water or other wells in any location on the Leased Premises without the prior written approval of the Air Force.

24.2. Prior to starting any Alterations, other construction, construction-related work, excavating, demolition, or restoration, the Lessee shall determine whether asbestos is present.

24.3. The Lessee shall not use or occupy or conduct any activities in any building, facility, structure or other improvement, or portion thereof, on the Leased Premises if such improvement or improvements contain any damaged or deteriorated ACM, as that term is defined in Conditions 10.5 and 10.6 of the Lease, until such time as the damaged or deteriorated ACM in them has been abated in accordance with Conditions 10.5 and 10.6.

24.4. The Lessee acknowledges that lead-based paint ("LBP") may be present in and on buildings, facilities, structures and other improvements and equipment on the Leased Premises. The Air Force may conduct surveys to determine the existence and extent of any LBP. The Lessee will be notified if the Air Force determines there is any LBP in or on any improvements and equipment on the Leased Premises. Prior to beginning any Alterations, other construction or construction-related work, excavating,

demolition, or restoration, the Lessee must test any paint that would be disturbed unless a conclusive determination has been made that LBP is not present. The Lessee is required to handle LBP in compliance with all applicable Environmental Laws at its own expense.

24.5. The Lessee will minimize the destruction, loss, or degradation of any wetlands within the Leased Premises. Before locating new construction in wetlands, the Lessee shall, in coordination with the Commander, contact the United States Army Corps of Engineers and local regulatory agencies as required, and obtain a permit or waivers under Section 404 of the Clean Water Act. For purposes of this condition, the term "new construction" includes structures, facilities, draining, dredging, channeling, filling, diking, impounding and related activities.

24.6. The Lessee shall not discharge, or allow the discharge of, any dredged or fill material into any waters or wetlands on the Leased Premises except with the express written consent of the Commander.

24.7. The Lessee shall conduct no mining operations, remove no sand, gravel or kindred substances from the ground, commit no waste of any kind, nor in any manner substantially change the contour or condition of the Leased Premises, except as may be authorized in writing by the Commander. Such authorization shall not be unreasonably withheld or delayed.

25. OPERATIONS

25.1. The Lessee shall complete construction and have a fully operational PV Array on the Leased Premises within twenty-four (24) months of the Term Beginning Date. Failure to do so will constitute a breach of this Lease by the Lessee.

25.1.1. The Lessee will operate and maintain the PV Array at no cost to the Government.

25.1.2. The Lessee will operate the PV Array in such manner as not to endanger personnel or property of the Government or obstruct travel on any road.

25.1.3. The PV Array shall be protected by a fence at least six (6) feet in height on all sides to prevent any unauthorized persons from entering on the site and tampering with the PV Array and to protect persons and property against the danger of electric shock. Construction or erection of the fence shall require be subject to the provisions of Condition 17 and all other applicable provisions of the Lease.

25.1.4. The Lessee may construct one (1) maintenance road for each solar panel array. Each such maintenance road shall be no wider than _____ () feet and extend for a distance no longer than the length of the particular solar panel for which that road is being constructed

25.2. The Lessee may bring on partial loads as the PV modules are completed, and Nellis AFB shall acquire power as the power comes on line.

25.3. The Government and the Lessee will, to the extent practicable, coordinate their respective operations, subject to Condition 22.1.

25.3. The Lessee shall not accept issuance of any permit or license which purports to impose on the Government any obligation or liability for any operations or activities covered by such permit or license without the prior written consent of the Government, which may be withheld in the Government's sole and absolute discretion.

25.4. The Government's rights of access and inspection under Conditions 10.4 and 13 include the right to observe Lessee's PV Array operations on Nellis AFB, and the Lessee expressly agrees to allow the Air Force, its officers, employees, agents, contractors and subcontractors to observe all such operations. The Lessee shall provide access to all current operations, maintenance, and other applicable process or procedure documentation. The Lessee will provide such access, documentation, and data at no cost to the Government.

26. LIENS AND MORTGAGES

26.1. Except as provided in this Condition 26, the Lessee shall not engage in any financing or other transaction creating any mortgage upon the Leased Premises; place or suffer to be placed upon the Leased Premises any lien or other encumbrance; or suffer any levy or attachment to be made on the Lessee's interest in the Leased Premises, other than such levy or attachment as may result from a foreclosure of a mortgage that is consistent with this Condition 26. Any inconsistent mortgage, encumbrance, or lien shall be deemed to be a violation of this covenant on the date of its execution or filing of record regardless of whether or when it is foreclosed or otherwise enforced, and is void in its inception.

26.2. During the term of this Lease, the Lessee may encumber its interest in the Leased Premises by way of one or more loans secured by a mortgage, subject to Condition 26.3 below. The proposed holder of any mortgage must be approved by the Lessee prior to the execution of such loan, which approval shall not be unreasonably withheld or delayed. Any loan may be further secured by a conditional assignment of the Lease (including the companion Operating Agreement (Exhibit D)) by the Lessee to the mortgagee. The Government agrees to execute an Estoppel Certificate and any other similar documentation as may reasonably be required by the mortgagee so as to give its consent to the conditional assignment of the Lease and to certify as to the status of this Lease and to the performance of the Lessee hereunder as of the date of such certification.

26.3. No mortgage shall extend to or affect the fee, the reversionary interest or the estate of the Government in the Leased Premises. No mortgage shall be binding

upon the Government in the enforcement of its rights and remedies under the Lease and by law provided, unless, and until a copy thereof shall have been delivered to the Government and such mortgage is authorized in accordance with the provisions of this Condition 26.

26.4. Promptly after assigning or encumbering the Leased Premises as permitted in accordance with Condition 26.3, the Lessee shall furnish the Government a written notice setting forth the name and address of such mortgagee. Further, the Lessee shall notify the Government promptly of any lien or encumbrance which has been created or attached to the Leased Premises, whether by act of the Lessee or otherwise, of which the Lessee has notice.

26.5. If a mortgagee or purchaser at foreclosure of the mortgage shall acquire the Lessee's interest in the Leased Premises, by virtue of the default by the Lessee under the mortgage or otherwise, the Lease shall continue in full force and effect so long as the mortgagee or purchaser at foreclosure is not in default thereunder. The mortgagee or purchaser at foreclosure may not appoint an agent or nominee to operate and manage any portion of the Leased Premises on its behalf without obtaining the prior written approval of the Government. Such approval shall require a determination that the proposed agent or nominee has demonstrated experience or expertise in the development, operation and maintenance a PV Array to supply and deliver renewable (solar power) utility service to Nellis AFB. For the period of time during which the mortgagee or any purchaser at foreclosure of a mortgage holds the Lessee's interest in the Leased Premises, the mortgagee or such purchaser shall become liable and fully bound by the provisions of the Lease.

26.6. With respect to the mortgagees of the Leased Premises, the Government agrees that the following shall apply:

26.6.1. If requested by a mortgagee which shall have duly registered in writing with the Government its name and address, any notice from the Government to the Lessee with respect to a default or termination of this Lease or other notice affecting the Leased Premises shall be simultaneously delivered to such mortgagee at its registered address, and in the event of any such registration, no notice of default or termination of this Lease affecting the Leased Premises given by the Government to the Lessee shall be deemed legally effective until and unless like notice shall have been given by the Government to such mortgagee.

26.6.2. Such mortgagee entitled to such notice shall have any and all rights of the Lessee with respect to the curing of any default hereunder by the Lessee.

26.6.3. The Government will not accept any cancellation by the Lessee or enter into any material modification of this Lease affecting the Leased Premises without the prior written consent thereto of each mortgagee who shall become entitled to notice as provided in this Condition 26. The foregoing shall not apply or be construed to apply to any right the Government may have to terminate this Lease pursuant to its

terms. It is also agreed that the Lessee shall provide any such mortgagee with notice of any proposed modification.

26.7. If the Government shall elect to terminate this Lease by reason of any default described herein with respect to the Lease, each mortgagee that shall have become entitled to notice as provided in this Condition 26 shall not only have any and all rights of the Lessee with respect to curing of any default, but also shall have the right to postpone and extend the specified date for the termination of this Lease ("Mortgagee's Right to Postpone") in any notice of termination by the Government to the Lessee ("Termination Notice"), subject to the following conditions:

26.7.1. Such mortgagee shall give the Government written notice of the exercise of the Mortgagee's Right to Postpone prior to the date of termination specified by the Government in the Termination Notice and simultaneously pay to the Government all amounts required to cure all defaults then existing (as of date of the exercise of Mortgagee's Right to Postpone) which may be cured by the payment of a sum of money.

26.7.2. Such mortgagee shall pay any sums and charges which may be due and owing by the Lessee and promptly undertake to cure, diligently prosecute and, as soon as reasonably possible, complete the curing all defaults of the Lessee which are susceptible of being cured by such mortgagee.

26.7.3. The Mortgagee's Right to Postpone shall extend the date for the termination of this Lease specified in the Termination Notice for a period of not more than six (6) months.

26.7.4. If, before the date specified for the termination of this Lease as extended by such mortgagee's exercise of Mortgagee's Right to Postpone, the assumption of performance and observance of the covenants and conditions herein contained on the Lessee's part to be performed under the Lease shall be delivered to the Government by the mortgagee, or its nominee and the mortgagee shall have complied with all obligations on the Lessee's part to be performed with respect to the Lease and no further defaults shall have occurred which shall not have been cured within the periods of time after notice above provided for; then and in such event, all defaults under this Lease shall be deemed to have been cured, and the Government's Termination Notice shall be deemed to have been withdrawn.

26.8. Nothing herein contained shall be deemed to impose any obligation on the part of the Government to deliver physical possession of the Leased Premises to such holder of a mortgage.

26.9. If more than one mortgagee shall seek to exercise any of the rights provided for in this Condition 26, the holder of the mortgage having priority of lien over the other mortgagees shall be entitled, as against the others, to exercise such rights.

Should a dispute arise among mortgagees regarding the priority of lien, the mortgagees must prove to the satisfaction of the Government that they have settled that dispute.

26.10. The mortgagee may not appoint an agent or nominee to operate and manage the Leased Premises on its behalf without obtaining the prior written approval of the Government. Such approval shall require a determination that the proposed agent or has demonstrated experience or expertise in the development, operation and maintenance of a PV Array to supply and deliver renewable (solar power) utility service to Nellis AFB.

27. GOVERNMENT RESERVED RIGHTS

27.1. The Government specifically reserves for its benefit easements and rights-of-way on, over and across any existing roads (and any rail line) that traverse the Leased Premises for full and free access. The Government shall, at all times during the existence of the Lease, have the right for itself, its employees, agents, contractors, subcontractors and invitees to use any such roads (and any rail track) without charge.

27.2. The Lessee shall be responsible for the maintenance and repair of any such road or roads at its expense as provided in and in accordance with Conditions 6 and 11 of the Lease. Notwithstanding the foregoing, the Government shall have the right at any time, at its option, to assume responsibility for the maintenance and repair of any such road or roads at the Government's expense.

28. AMENDMENTS

28.1. This Lease may be amended at any time by mutual agreement of the Parties in writing and signed by a duly authorized representative of each of the respective Parties hereto. Amendments to the Lease executed on behalf of the Air Force must be signed at the level of Deputy Assistant Secretary of the Air Force (Installations) or higher.

28.2. The Operating Agreement may be amended at any time by the Parties to it, in writing, in accordance with its terms.

29. NOTICE OF HAZARDOUS SUBSTANCES

29.1. Exhibit F hereto provides information concerning hazardous substances that have been stored for one year or more or are known to have been released or disposed of on certain portions of the Leased Premises and the date(s) that such storage, release or disposal took place.

30. REPRESENTATIVES AND THEIR SUCCESSORS

30.1. The Installation Commander 99th ABW, Nellis AFB, has been duly authorized to administer this Lease.

30.2. Except as otherwise specifically provided, any reference herein to "Commander" shall include the Commander's duly appointed successors and authorized representatives. Any reference to "Lessee" shall include any sublessees, assignees, transferees, successor and their duly authorized representatives.

31. REPORTING TO CONGRESS

31.1. The provisions of 10 U.S.C.A. § 2662 have been complied with.

32. EFFECTIVE DATE AND RECORDING

32.1. This Lease shall be binding on the Parties on the day following its execution by the duly authorized representatives of both Parties.

32.2. This Lease or a Notice of this Lease may be filed for record in Clark County, Nevada, on or after the Term Beginning Date.

33. EXHIBITS

33.1. Five (5) exhibits are attached to and made a part of this Lease, as follows:

Exhibit A: Legal Description of the Leased Premises
Exhibit B: Map of the Leased Premises
Exhibit C: Environmental Site Assessment
Exhibit D: Operating Agreement
Exhibit E: Interconnect Agreement
Exhibit F: Notice of Hazardous Substances

33.2. One (1) exhibit will be attached to and made a part of the Lease upon its expiration or earlier termination, as follows:

Exhibit C-1 - Environmental Site Assessment

IN WITNESS WHEREOF I have hereunto set my hand by authority of the Secretary of the Air Force this _____ day of _____, 2006.

By _____
Fred W. Kuhn
Deputy Assistant Secretary of the Air Force
(Installations)

THIS LEASE is also executed by the Lessee this ____ day of _____, 2006

By _____

Title _____

FA4861-06-D-B500

Attachment 2

May 23, 2006

COMMONWEALTH OF VIRGINIA)
) SS.:
COUNTY OF ARLINGTON)

On the ____ day of _____, 2006, before me, _____, the undersigned Notary Public, personally appeared Fred W. Kuhn, personally known to me to be the person whose name is subscribed to the foregoing Lease No. _____, covering certain real property on Nellis Air Force Base, and personally known to me to be the Deputy Assistant Secretary of the Air Force (Installations), and acknowledged that the same was the act and deed of the Secretary of the Air Force and that he executed the same as the act of the Secretary of the Air Force.

Notary Public, Commonwealth of Virginia
My commission expires:

FA4861-06-D-B500
Attachment 2
May 23, 2006

[ATTACH OR INSERT ACKNOWLEDGMENT FOR LESSEE]

FA4861-06-D-B500
Attachment 2
May 23, 2006

LEASE NO: _____

DEPARTMENT OF THE AIR FORCE
MODEL LEASE AGREEMENT OF PROPERTY
ON
NELLIS AIR FORCE BASE, NEVADA

between

THE SECRETARY OF THE AIR FORCE
on behalf of
THE UNITED STATES OF AMERICA

and

_____, 2006

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APPENDIX D. SOLAR POWER AWARD

SOLICITATION, OFFER AND AWARD				1. THIS CONTRACT IS A RATED ORDER UNDER DPAS (15 CFR 700)		RATING		PAGE 1 OF 24 PAGES			
2. CONTRACT NO. FA4861-06-D-B500		3. SOLICITATION NO. FA4861-06-R-B501		4. TYPE OF SOLICITATION <input type="checkbox"/> SEALED BID (IFB) <input checked="" type="checkbox"/> NEGOTIATED (RFP)		5. DATE ISSUED 18 Apr 2006		6. REQUISITION/PURCHASE NO.			
7. ISSUED BY 99 CONSILGCB2 5085 SWANAB BLVD (BLDG 588) NELLIS AFB NV 89191-7063				CODE FA4861		8. ADDRESS OFFER TO (If other than Item 7)		CODE			
TEL: 702-652-2099 FAX				See Item 7				TEL: FAX			
NOTE: In sealed bid solicitations "offer" and "offeror" mean "bid" and "bidder".											
SOLICITATION											
9. Sealed offers in original and _____ copies for furnishing the supplies or services in the Schedule will be received at the place specified in Item 8, or if hand-carried, in the depository located in _____ until <u>12:00 PM</u> local time <u>16 Jun 2006</u> (Hour) (Date)											
CAUTION - LATE Submissions, Modifications, and Withdrawals: See Section L, Provision No. 52.214-7 or 52.215-1. All offers are subject to all terms and conditions contained in this solicitation.											
10. FOR INFORMATION: A. NAME CALL: DAVID ROBLEDO				B. TELEPHONE (Include area code) (NO COLLECT CALLS) 702-652-2099				C. E-MAIL ADDRESS david.robledo@nellis.af.mil			
11. TABLE OF CONTENTS											
(X) SEC	DESCRIPTION			PAGE(S)	(X) SEC	DESCRIPTION			PAGE(S)		
PART I - THE SCHEDULE					PART II - CONTRACT CLAUSES						
X A	SOLICITATION/ CONTRACT FORM			1	X I	CONTRACT CLAUSES			10 - 23		
X B	SUPPLIES OR SERVICES AND PRICES/ COSTS			2	PART III - LIST OF DOCUMENTS, EXHIBITS AND OTHER ATTACHMENTS						
X C	DESCRIPTION/ SPECS/ WORK STATEMENT			3 - 7	X J	LIST OF ATTACHMENTS			24		
	D. PACKAGING AND MARKING				PART IV - REPRESENTATIONS AND INSTRUCTIONS						
X E	INSPECTION AND ACCEPTANCE			8	K	REPRESENTATIONS, CERTIFICATIONS AND OTHER STATEMENTS OF OFFERORS					
X F	DELIVERIES OR PERFORMANCE			9		L. INSTRS, CONDS, AND NOTICES TO OFFERORS					
	G. CONTRACT ADMINISTRATION DATA					M. EVALUATION FACTORS FOR AWARD					
	H. SPECIAL CONTRACT REQUIREMENTS										
OFFER (Must be fully completed by offeror)											
NOTE: Item 12 does not apply if the solicitation includes the provisions at 52.214-16, Minimum Bid Acceptance Period											
12. In compliance with the above, the undersigned agrees, if this offer is accepted within _____ calendar days (60 calendar days unless a different period is inserted by the offeror) from the date for receipt of offers specified above, to furnish any or all items upon which prices are offered at the price set opposite each item, delivered at the designated point(s), within the time specified in the schedule.											
13. DISCOUNT FOR PROMPT PAYMENT (See Section I, Clause No. 52.232-8)				Net 30 Days							
14. ACKNOWLEDGMENT OF AMENDMENTS (The offeror acknowledges receipt of amendments to the SOLICITATION for offerors and related documents numbered and dated):				AMENDMENT NO.		DATE		AMENDMENT NO.		DATE	
15A. NAME AND ADDRESS OF OFFEROR		CODE 1YAR8		FACILITY 1YAR8		16. NAME AND TITLE OF PERSON AUTHORIZED TO SIGN OFFER (Type or print) MARK BRONEZ / VP OF SALES					
POWERLIGHT CORPORATION MARK BRONEZ 2954 SAN PABLO AVE BERKELEY CA 94702-2471											
15B. TELEPHONE NO. (Include area code) 510-668-1328				15C. CHECK IF REMITTANCE ADDRESS IS DIFFERENT FROM ABOVE - ENTER SUCH ADDRESS IN SCHEDULE <input type="checkbox"/>		17. SIGNATURE		18. OFFER DATE			
AWARD (To be completed by Government)											
19. ACCEPTED AS TO ITEMS NUMBERED Clin 0001				20. AMOUNT \$15,468,172.00 EST		21. ACCOUNTING AND APPROPRIATION					
22. AUTHORITY FOR USING OTHER THAN FULL AND OPEN COMPETITION: <input type="checkbox"/> 10 U.S.C. 2304(c)() <input type="checkbox"/> 41 U.S.C. 253(c)()						23. SUBMIT INVOICES TO ADDRESS SHOWN IN (4 copies unless otherwise specified)		ITEM			
24. ADMINISTERED BY (If other than Item 7) See Item 7				CODE		25. PAYMENT WILL BE MADE BY DFAS-U (LIMESTONE) - F 67100 27 ARKANSAS ROAD CUSTOMER SERVICE: 800-337-0371 LIMESTONE ME 04751-1500		CODE F67100			
26. NAME OF CONTRACTING OFFICER (Type or print) WILLIE J. RANDOLPH TEL: 702-652-9571 EMAIL: willie.randolph@nellis.af.mil						27. UNITED STATES OF AMERICA (Signature of Contracting Officer)		28. AWARD DATE 27-Jul-2006			
IMPORTANT - Award will be made on this Form, or on Standard Form 26, or by other authorized official written notice.											

Previous Edition is Unusable

33-134

STANDARD FORM 33 (REV. 9-97)
Prescribed by GSA
FAR (48 CFR) 33.214(c)

Section B - Supplies or Services and Prices

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0001	Solar Photovoltaic Array FFP Purchase of renewable solar energy supplied using the contractor's transmission lines from a Solar Photovoltaic Array (PV Array) to interconnect delivery point with the Nevada Power Company distribution system to Nellis AFB, as described in the Performance Work Statement. Reference PowerLight Proposal dated 12 Jul 2006 Volume 1(Revised) Flat rate: \$xxxx/kWh \$ xxxx x xx,xxx,xxxkwh = \$773,408.60 annually Escalation Factor for Subsequent Years: 0.00% Reference PowerLight proposal dated 12 Jul 2006, Volume 4 (Revised) Contractor will bill on a monthly basis. TERM OF CONTRACT: This is an indefinite term contract that shall continue in effect until terminated at the option of the Government by giving written notice not less than 365 days in advance of the effective date of the termination NSN: 6117-SO-LAR-POWE SIGNAL CODE: A	20	Years	\$773,408.60	\$15,468,172.00 EST

NET AMT	\$15,468,172.00 (EST.)
---------	------------------------

Funded Amount	\$0.00
---------------	--------

FOB: Destination

Section C - Descriptions and Specifications

DESCRIP/SPECIF/WORK STATEMENT

SECTION C

Description/Specifications/Work Statement**C.1 Nellis AFB Overview**

Nellis Air Force Base (NAFB) is an active military installation located in Clark County, Nevada. The base is approximately 8 miles northeast of Las Vegas, Nevada. NAFB is the home of the Air Warfare Center (AWFC). NAFB, has three wings - the 57th Wing (57 WG), the 98th Range Wing (98 RANW), and the 99th Air Base Wing (99 ABW).

C.2 Requirement**C.2.1 Qualified Utility Provider**

This utility service shall comply with all applicable federal, state, interstate, and local laws and regulations, as they may be amended from time to time, including those requirements relating to health, safety and the environment.

C.2.2 Renewable Solar Energy Supply

The contractor shall determine the optimum PV array size for Nellis AFB based on historic meter data, sun's angle of declination, proposed PV panel specifications, terrain, and available land. The Government's preliminary calculations show the PV array size will be in the range of 15MW (DC) to 20 MW (DC). A spreadsheet is included in the technical library that provides historical 15-minute interval meter data for Nellis AFB. The PV array will be designed so that Nellis AFB will use all the power produced. The contractor is required to complete all construction and have an operational PV array within 24 months of contract award. The contractor may bring on partial loads as PV modules are completed and Nellis will acquire the power as it comes on line. The contractor shall explain how excess power, i.e. when the PV output is greater than base demand, will be consumed and billed.

C.2.3 Construction

The PV array installed under this contract shall meet the following criteria:

C.2.3.1 The government will provide approximately 140 acres set aside in the vicinity of Range Road and the closed landfill (see map, Section J) for the construction of a PV array on Nellis AFB. Such land will be conveyed via a separate ground lease.

C.2.3.2 As an onsite generator of solar power, the contractor will operate its solar array in parallel with the electricity supplied to Nellis AFB by Nevada Power Company from outside the base. The contractor will provide all inverters, transformers, switchgear, wiring and protective devices to connect to the base electrical distribution system. **Offerors must submit evidence with their proposals that a request to Nevada Power Company for an Interconnect Agreement has been made, and no contract can be awarded until an Interconnect Agreement with Nevada Power Company is secured.**

C.2.3.3 The PV array shall be protected on all sides to prevent unauthorized persons from entering the area, tampering with the array and to protect against the danger of electric shock. As a minimum, the height of the fence shall be six feet. Nellis AFB shall approve the type of fence.

C.2.3.4 The contractor shall take action or modifications necessary to assure the PV array is compatible with Nellis AFB electrical distribution system. Any proposed modifications that would affect the Nellis AFB electrical distribution system will require the approval of Nellis AFB. The PV array shall not have any adverse effects on the Nellis AFB electrical distribution system, or on loading, power factor, voltage levels, transformers, structural integrity, protection device coordination, or the operation of any base electrical equipment.

C.2.3.5 The PV array shall produce power that is inverted and transformed to the 12.47 KV three-phase system base electrical distribution system. The power supplied to Nellis AFB shall be free from power quality issues such as surge, undervoltage, overvoltage, harmonics, voltage sag, or voltage swell. In the event of a power outage at Nellis AFB substation or from the Nevada Power Company substation, the PV array will automatically stop producing power. Once base power is restored and detected, the PV array will automatically resume producing power.

C.2.3.6 The proposer shall use a 15KA combo fused cutout / lighting arrestor mounted on an aluminum bracket (aluminum bracket for mounting) where needed and at all locations where the PV array connects to the Nellis AFB electrical infrastructure.

C.2.3.7 The PV array will not adversely affect water drainage patterns on Nellis AFB, the landfill, or landfill cap. It will comply with all environmental requirements and standards.

C.2.3.8 Codes and Standards. The contractor shall use the 2002 National Electrical Code (NEC), Unified Facilities Criteria (UFC) 3-550-03FA DESIGN: Electrical Supply Power and Distribution, National Electric Safety Code (NESC), and other applicable federal, state, and industry standards as applied to this project. All work performed by Contractor shall be guided by these specifications in conjunction with this statement of work. The Contractor is responsible for reading and understanding the specifications and statement of work.

C.2.3.9 Nellis AFB reserves the right to reschedule the proposer's work requiring service interruption at any time if such interruption might adversely affect Nellis AFB's missions and operations.

C.2.3.10 The proposer shall obtain a written excavation permit from Civil Engineering before commencing any digging or excavation on the installation. The excavation permit will contain requirements normally applied to similar excavation work on the installation. The Contracting Officer or designated representative will notify the contractor as to reasonable time periods for applying for an excavation permit.

C.2.4 Maintenance

The Contractor will be responsible for all aspects of maintaining the PV array, including but not limited to cleaning the arrays, replacing broken or worn out system components, performing maintenance in accordance with equipment manufacturer recommendations, and ensuring that every part of the array is operating according to design, producing the maximum amount of power possible and free of power quality issues. To the maximum extent possible, the contractor shall schedule maintenance and repair of the solar array at times when output of the array is at its lowest point such that charges for power paid by Nellis AFB to Nevada Power Company are minimized.

The Contractor will perform normal housekeeping functions inside and outside his facilities and job site locations. Such functions include sweeping, mopping, dusting, disposal of accumulated waste materials and rubbish and other operations necessary to present a neat appearance. All rubbish and waste materials shall be properly disposed of. The Contractor shall store all supplies and equipment only at approved storage area so as to preclude theft or damage and maintain the site in a neat and orderly manner. Loose debris on trucks leaving the site shall be loaded in a manner that will prevent dropping of materials on the streets and shall have a suitable cover, such as a tarpaulin, over the load before entering surrounding streets. The Contractor shall be responsible for immediately cleaning up any materials that fall from trucks.

C.2.5 Base Access

The Contractor shall apply for personnel security clearances within 5 days after receipt of the facility clearance or within 30 days after award of the contract if the Contractor already possesses a facility clearance, whichever is sooner. Personnel requiring access to secured areas or restricted areas under the control of the Installation shall comply with applicable regulations. See clause 5352.242-9000 for installation access instructions.

C.2.6 Environmental Compliance

C.2.6.1 Hazardous Substances. The Contractor, at his expense, must comply with all applicable laws on occupational safety and health, the handling and storage of hazardous materials, and the proper handling and disposal of hazardous wastes and hazardous substances generated by its activities. Applicable law governs responsibility for the costs of proper handling and disposal of hazardous wastes and hazardous substances. The terms hazardous materials, hazardous wastes, and hazardous substances are as defined in the Federal Water Pollution Control Act, the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, the Solid Waste Disposal Act, the Clean Air Act, and the Toxic Substances Control Act, and their implementing regulations, as they may be amended from time to time. All hazardous materials used on the Installation shall be accompanied with appropriate Material Safety Data Sheets (MSDS). The Contractor shall submit copies of MSDSs to the Contracting Officer's Representative, and retain a copy of each MSDS onsite.

C.2.6.2 Asbestos and Lead-based Paint. The contractor will not make any improvements or engage in any construction on government property which contain asbestos-containing material (ACM), without prior approval of the contracting officer; any such improvements or construction shall be done in compliance with all applicable Federal, state, interstate, and local laws and regulations governing ACM. The contractor is responsible for monitoring the condition of its property containing ACM on any portion of government property for deterioration or damage. The contractor is responsible, at its expense, for remediation of any ACM contained on or in its property which is disturbed or damaged by the contractor or is deteriorated and of any ACM on government property which is disturbed or damaged by the contractor during the term of the contract. The contractor will test any painted surface to be affected by any of its operation, construction, installation, repair, or maintenance activities to determine if the paint is lead-based and will handle that surface in compliance with all applicable laws and regulations and at the contractor's expense.

C.2.6.3 Disposal of Waste. All Contractor generated refuse/waste from the construction project shall be removed to the on-base disposal site at no additional expense to the Government. Batteries, tires, and various other types of hazardous waste shall not be dumped in the on-base landfill.

C.2.6.4 Environmental Baseline Survey (EBS). An EBS and an Environmental Analysis (EA) will be accomplished by the Government and provided to the contractor before contract award.

C.2.7 Liability

The Contractor shall indemnify and hold the Government harmless against any and all judgments, expenses, liabilities, claims, and charges of whatever kind or nature that may arise as a result of the activities of the Contractor, whether tortious, contractual, or other, except to the extent such claim or charge is cognizable under the Federal Tort Claims Act, or, in regard to indemnification, to the extent the Contractor is prohibited from doing so by Federal or state law.

C.2.8 Employees

The Contractor shall not employ any person for work on this contract if such person is identified to the Contractor as a potential threat to the health, safety, security, general well being, or operational mission of the Installation or population.

C.3. Access to Service Location.

The Government hereby grants to the Contractor, subject to the limitations specified in the ground lease, a revocable permit to enter the Service Location for any proper purpose under this contract, including use of site or sites agreed upon by the parties hereto for the installation, operation, and maintenance of the facilities of the Contractor. Authorized representatives of the Contractor will be allowed access to the facilities of the Contractor and the Government at suitable times to perform the obligations of the Contractor with respect to such facilities. It is expressly understood, however, that proper military or Governmental authority may limit or restrict the right of access herein granted in any manner considered by such authority to be necessary for the national security.

C.4. Monthly Submittals

The Contractor shall provide the Government monthly submittals for the following:

Outage Report. The Contractor's monthly outage report will be prepared in the format proposed by the Contractor and accepted by the Contracting Officer. Outage reports shall be submitted by the 25th of each month for the previous month. Outage reports shall be submitted to:

Name: 99CONS/LGCB

Contract Number: FA4861-06-D-B500

Address: 5865 Swaab Blvd Bldg 588, Nellis AFB, NV 89191-7063

Phone number: 702-652-2099

Meter Reading Report. The monthly meter reading report shall show the current and previous month readings for all secondary meters. The Contractor's monthly meter reading report will be prepared in the format proposed by the Contractor and accepted by the Contracting Officer. Meter reading reports shall be submitted by the 15th of each month for the previous month. Meter reading reports shall be submitted to:

Name: 99CONS/LGCB

Contract Number FA4861-06-D-B500

Address: 5865 Swaab Blvd Bldg 588, Nellis AFB, NV 89191-7063

Phone number: 702-652-2099

Section E - Inspection and Acceptance

INSPECTION AND ACCEPTANCE TERMS

Supplies/services will be inspected/accepted at:

CLIN	INSPECT AT	INSPECT BY	ACCEPT AT	ACCEPT BY
0001	Destination	Government	Destination	Government

Section F - Deliveries or Performance

DELIVERY INFORMATION				
CLIN	DELIVERY DATE	QUANTITY	SHIP TO ADDRESS	UIC
0001	POP 01-AUG-2006 TO 31-JUL-2026	N/A	99 CES - F14852 JEFF BLAZI 6020 BEALE AVE, BLDG 812 NELLIS AFB NV 89191-7260 702-652-7790 FOB: Destination	F14852

Section I - Contract Clauses

CLAUSES INCORPORATED BY REFERENCE

52.202-1	Definitions	JUL 2004
52.203-6	Restrictions On Subcontractor Sales To The Government	JUL 1995
52.203-12	Limitation On Payments To Influence Certain Federal Transactions	SEP 2005
52.204-4	Printed or Copied Double-Sided on Recycled Paper	AUG 2000
52.204-7	Central Contractor Registration	OCT 2003
52.207-3	Right of First Refusal of Employment	NOV 1991
52.209-6	Protecting the Government's Interest When Subcontracting With Contractors Debarred, Suspended, or Proposed for Debarment	JAN 2005
52.212-4	Contract Terms and Conditions--Commercial Items	SEP 2005
52.215-2	Audit and Records--Negotiation	JUN 1999
52.215-8	Order of Precedence--Uniform Contract Format	OCT 1997
52.215-11	Price Reduction for Defective Cost or Pricing Data--Modifications	OCT 1997
52.215-13	Subcontractor Cost or Pricing Data--Modifications	OCT 1997
52.215-21	Requirements for Cost or Pricing Data or Information Other Than Cost or Pricing Data--Modifications	OCT 1997
52.217-2	Cancellation Under Multiyear Contracts	OCT 1997
52.222-1	Notice To The Government Of Labor Disputes	FEB 1997
52.222-3	Convict Labor	JUN 2003
52.222-4	Contract Work Hours and Safety Standards Act - Overtime Compensation	JUL 2005
52.222-37	Employment Reports On Special Disabled Veterans, Veterans Of The Vietnam Era, and Other Eligible Veterans	DEC 2001
52.223-3	Hazardous Material Identification And Material Safety Data	JAN 1997
52.223-6	Drug-Free Workplace	MAY 2001
52.223-14	Toxic Chemical Release Reporting	AUG 2003
52.225-13	Restrictions on Certain Foreign Purchases	FEB 2006
52.227-1	Authorization and Consent	JUL 1995
52.228-5	Insurance - Work On A Government Installation	JAN 1997
52.229-3	Federal, State And Local Taxes	APR 2003
52.230-6	Administration of Cost Accounting Standards	APR 2005
52.232-1	Payments	APR 1984
52.232-8	Discounts For Prompt Payment	FEB 2002
52.232-11	Extras	APR 1984
52.232-17	Interest	JUN 1996
52.232-18	Availability Of Funds	APR 1984
52.232-23	Assignment Of Claims	JAN 1986
52.232-33	Payment by Electronic Funds Transfer--Central Contractor Registration	OCT 2003
52.233-1	Disputes	JUL 2002
52.237-2	Protection Of Government Buildings, Equipment, And Vegetation	APR 1984

52.237-3	Continuity Of Services	JAN 1991
52.241-2	Order of Precedence - Utilities	FEB 1995
52.241-4	Change in Class of Service	FEB 1995
52.241-5	Contractor's Facilities	FEB 1995
52.241-11	Multiple Service Locations	FEB 1995
52.242-13	Bankruptcy	JUL 1995
52.242-15	Stop-Work Order	AUG 1989
52.243-1 Alt I	Changes--Fixed Price (Aug 1987) - Alternate I	APR 1984
52.246-4	Inspection Of Services--Fixed Price	AUG 1996
52.246-20	Warranty Of Services	MAY 2001
52.248-1	Value Engineering	FEB 2000
52.249-2	Termination For Convenience Of The Government (Fixed-Price)	MAY 2004
52.249-8	Default (Fixed-Price Supply & Service)	APR 1984
252.204-7000	Disclosure Of Information	DEC 1991
252.204-7003	Control Of Government Personnel Work Product	APR 1992
252.204-7004 Alt A	Central Contractor Registration (52.204-7) Alternate A	NOV 2003
252.205-7000	Provision Of Information To Cooperative Agreement Holders	DEC 1991
252.209-7004	Subcontracting With Firms That Are Owned or Controlled By The Government of a Terrorist Country	MAR 1998
252.209-7004	Subcontracting With Firms That Are Owned or Controlled By The Government of a Terrorist Country	MAR 1998
252.223-7001	Hazard Warning Labels	DEC 1991
252.223-7006	Prohibition On Storage And Disposal Of Toxic And Hazardous Materials	APR 1993
252.231-7000	Supplemental Cost Principles	DEC 1991
252.235-7003	Frequency Authorization	DEC 1991
252.241-7001	Government Access	DEC 1991
252.243-7001	Pricing Of Contract Modifications	DEC 1991
LF-100	Federal Holidays	MAY 2003

CLAUSES INCORPORATED BY FULL TEXT

52.212-5 CONTRACT TERMS AND CONDITIONS REQUIRED TO IMPLEMENT STATUTES OR EXECUTIVE ORDERS--COMMERCIAL ITEMS (FEB 2006)

(a) The Contractor shall comply with the following Federal Acquisition Regulation (FAR) clauses, which are incorporated in this contract by reference, to implement provisions of law or Executive orders applicable to acquisitions of commercial items:

(1) 52.233-3, Protest After Award (AUG 1996) (31 U.S.C. 3553).

(2) 52.233-4, Applicable Law for Breach of Contract Claim (OCT 2004) (Pub. L. 108-77, 108-78).

(b) The Contractor shall comply with the FAR clauses in this paragraph (b) that the Contracting Officer has indicated as being incorporated in this contract by reference to implement provisions of law or Executive orders applicable to acquisitions of commercial items: (Contracting Officer check as appropriate.)

___ (1) 52.203-6, Restrictions on Subcontractor Sales to the Government (JUL 1995), with Alternate I (OCT 1995) (41 U.S.C. 253g and 10 U.S.C. 2402).

___ (2) 52.219-3, Notice of HUBZone Small Business Set-Aside (Jan 1999) (15 U.S.C. 657a).

___ (3) 52.219-4, Notice of Price Evaluation Preference for HUBZone Small Business Concerns (JUL 2005) (if the offeror elects to waive the preference, it shall so indicate in its offer) (15 U.S.C. 657a).

___ (4) [Removed].

___ (5)(i) 52.219-6, Notice of Total Small Business Set-Aside (JUNE 2003) (15 U.S.C. 644).

___ (ii) Alternate I (OCT 1995) of 52.219-6.

___ (iii) Alternate II (MAR 2004) of 52.219-6.

___ (6)(i) 52.219-7, Notice of Partial Small Business Set-Aside (JUNE 2003) (15 U.S.C. 644).

___ (ii) Alternate I (OCT 1995) of 52.219-7.

___ (iii) Alternate II (MAR 2004) of 52.219-7.

X (7) 52.219-8, Utilization of Small Business Concerns (MAY 2004) (15 U.S.C. 637 (d)(2) and (3)).

___ (8)(i) 52.219-9, Small Business Subcontracting Plan (JUL 2005) (15 U.S.C. 637(d)(4)).

___ (ii) Alternate I (OCT 2001) of 52.219-9

___ (iii) Alternate II (OCT 2001) of 52.219-9.

___ (9) 52.219-14, Limitations on Subcontracting (DEC 1996) (15 U.S.C. 637(a)(14)).

___ (10)(i) 52.219-23, Notice of Price Evaluation Adjustment for Small Disadvantaged Business Concerns (SEP 2005) (10 U.S.C. 2323) (if the offeror elects to waive the adjustment, it shall so indicate in its offer).

___ (ii) Alternate I (JUNE 2003) of 52.219-23.

___ (11) 52.219-25, Small Disadvantaged Business Participation Program--Disadvantaged Status and Reporting (OCT 1999) (Pub. L. 103-355, section 7102, and 10 U.S.C. 2323).

___ (12) 52.219-26, Small Disadvantaged Business Participation Program--Incentive Subcontracting (OCT 2000) (Pub. L. 103-355, section 7102, and 10 U.S.C. 2323).

___ (13) 52.219-27, Notice of Total Service-Disabled Veteran-Owned Small Business Set-Aside (May 2004).

___ (14) 52.222-3, Convict Labor (JUNE 2003) (E.O. 11755).

X (15) 52.222-19, Child Labor--Cooperation with Authorities and Remedies (JAN 2006) (E.O. 13126).

- ☒ (16) 52.222-21, Prohibition of Segregated Facilities (FEB 1999).
- ☒ (17) 52.222-26, Equal Opportunity (APR 2002) (E.O. 11246).
- ☒ (18) 52.222-35, Equal Opportunity for Special Disabled Veterans, Veterans of the Vietnam Era, and Other Eligible Veterans (DEC 2001) (38 U.S.C. 4212).
- ☒ (19) 52.222-36, Affirmative Action for Workers with Disabilities (JUN 1998) (29 U.S.C. 793).
- ☐ (20) 52.222-37, Employment Reports on Special Disabled Veterans, Veterans of the Vietnam Era, and Other Eligible Veterans (DEC 2001) (38 U.S.C. 4212).
- ☐ (21) 52.222-39, Notification of Employee Rights Concerning Payment of Union Dues or Fees (DEC 2004) (E.O. 13201).
- ☒ (22)(i) 52.223-9, Estimate of Percentage of Recovered Material Content for EPA-Designated Products (AUG 2000) (42 U.S.C. 6962(c)(3)(A)(ii)).
- ☐ (ii) Alternate I (AUG 2000) of 52.223-9 (42 U.S.C. 6962(i)(2)(c)).
- ☐ (23) 52.225-1, Buy American Act--Supplies (JUNE 2003) (41 U.S.C. 10a-10d).
- ☒ (24)(i) 52.225-3, Buy American Act--Free Trade Agreements--Israeli Trade Act (JAN 2006) (41 U.S.C. 10a-10d, 19 U.S.C. 3301 note, 19 U.S.C. 2112 note, Pub. L. 108-77, 108-78, 108-286).
- ☐ (ii) Alternate I (JAN 2004) of 52.225-3.
- ☐ (iii) Alternate II (JAN 2004) of 52.225-3.
- ☐ (25) 52.225-5, Trade Agreements (JAN 2006) (19 U.S.C. 2501, et seq., 19 U.S.C. 3301 note).
- ☐ (26) 52.225-13, Restrictions on Certain Foreign Purchases (FEB 2006) (E.O.s, proclamations, and statutes administered by the Office of Foreign Assets Control of the Department of Treasury).
- ☐ (27) 52.225-15, Sanctioned European Union Country End Products (FEB 2000) (E.O. 12849).
- ☐ (28) 52.225-16, Sanctioned European Union Country Services (FEB 2000) (E.O. 12849).
- ☐ (29) 52.232-29, Terms for Financing of Purchases of Commercial Items (FEB 2002) (41 U.S.C. 255(f), 10 U.S.C. 2307(f)).
- ☐ (30) 52.232-30, Installment Payments for Commercial Items (OCT 1995) (41 U.S.C. 255(f), 10 U.S.C. 2307(f)).
- ☐ (31) 52.232-33, Payment by Electronic Funds Transfer--Central Contractor Registration (OCT 2003) (31 U.S.C. 3332).

X (32) 52.232-34, Payment by Electronic Funds Transfer--Other than Central Contractor Registration (MAY 1999) (31 U.S.C. 3332).

 (33) 52.232-36, Payment by Third Party (MAY 1999) (31 U.S.C. 3332).

 (34) 52.239-1, Privacy or Security Safeguards (AUG 1996) (5 U.S.C. 552a).

 (35)(i) 52.247-64, Preference for Privately Owned U.S.-Flag Commercial Vessels (FEB 2006) (46 U.S.C. Appx 1241(b) and 10 U.S.C. 2631).

 (ii) Alternate I (APR 2003) of 52.247-64.

(c) The Contractor shall comply with the FAR clauses in this paragraph (c), applicable to commercial services, that the Contracting Officer has indicated as being incorporated in this contract by reference to implement provisions of law or Executive orders applicable to acquisitions of commercial items: [Contracting Officer check as appropriate.]

 (1) 52.222-41, Service Contract Act of 1965, as Amended (JUL 2005) (41 U.S.C. 351, et seq.).

 (2) 52.222-42, Statement of Equivalent Rates for Federal Hires (MAY 1989) (29 U.S.C. 206 and 41 U.S.C. 351, et seq.).

 (3) 52.222-43, Fair Labor Standards Act and Service Contract Act--Price Adjustment (Multiple Year and Option Contracts) (MAY 1989) (29 U.S.C. 206 and 41 U.S.C. 351, et seq.).

 (4) 52.222-44, Fair Labor Standards Act and Service Contract Act--Price Adjustment (February 2002) (29 U.S.C. 206 and 41 U.S.C. 351, et seq.).

 (5) 52.222-47, SCA Minimum Wages and Fringe Benefits Applicable to Successor Contract Pursuant to Predecessor Contractor Collective Bargaining Agreements (CBA) (May 1989) (41 U.S.C. 351, et seq.).

(d) Comptroller General Examination of Record. The Contractor shall comply with the provisions of this paragraph (d) if this contract was awarded using other than sealed bid, is in excess of the simplified acquisition threshold, and does not contain the clause at 52.215-2, Audit and Records--Negotiation.

(1) The Comptroller General of the United States, or an authorized representative of the Comptroller General, shall have access to and right to examine any of the Contractor's directly pertinent records involving transactions related to this contract.

(2) The Contractor shall make available at its offices at all reasonable times the records, materials, and other evidence for examination, audit, or reproduction, until 3 years after final payment under this contract or for any shorter period specified in FAR Subpart 4.7, Contractor Records Retention, of the other clauses of this contract. If this contract is completely or partially terminated, the records relating to the work terminated shall be made available for 3 years after any resulting final termination settlement. Records relating to appeals under the disputes clause or to litigation or the settlement of claims arising under or relating to this contract shall be made available until such appeals, litigation, or claims are finally resolved.

(3) As used in this clause, records include books, documents, accounting procedures and practices, and other data, regardless of type and regardless of form. This does not require the Contractor to create or maintain any record that the Contractor does not maintain in the ordinary course of business or pursuant to a provision of law.

(e) (1) Notwithstanding the requirements of the clauses in paragraphs (a), (b), (c), and (d) of this clause, the Contractor is not required to flow down any FAR clause, other than those in paragraphs (i) through (vi) of this paragraph in a subcontract for commercial items. Unless otherwise indicated below, the extent of the flow down shall be as required by the clause--

(i) 52.219-8, Utilization of Small Business Concerns (May 2004) (15 U.S.C. 637(d)(2) and (3)), in all subcontracts that offer further subcontracting opportunities. If the subcontract (except subcontracts to small business concerns) exceeds \$500,000 (\$1,000,000 for construction of any public facility), the subcontractor must include 52.219-8 in lower tier subcontracts that offer subcontracting opportunities.

(ii) 52.222-26, Equal Opportunity (April 2002) (E.O. 11246).

(iii) 52.222-35, Equal Opportunity for Special Disabled Veterans, Veterans of the Vietnam Era, and Other Eligible Veterans (December 2001) (38 U.S.C. 4212).

(iv) 52.222-36, Affirmative Action for Workers with Disabilities (June 1998) (29 U.S.C. 793).

(v) 52.222-39, Notification of Employee Rights Concerning Payment of Union Dues or Fees (DEC 2004) (E.O. 13201).

(vi) 52.222-41, Service Contract Act of 1965, as Amended (Jul 2005), flow down required for all subcontracts subject to the Service Contract Act of 1965 (41 U.S.C. 351, et seq.).

(vii) 52.247-64, Preference for Privately Owned U.S.-Flag Commercial Vessels (FEB 2006) (46 U.S.C. Appx 1241(b) and 10 U.S.C. 2631). Flow down required in accordance with paragraph (d) of FAR clause 52.247-64.

(2) While not required, the contractor May include in its subcontracts for commercial items a minimal number of additional clauses necessary to satisfy its contractual obligations.

(End of clause)

52.223-5 POLLUTION PREVENTION AND RIGHT-TO-KNOW INFORMATION (AUG 2003)

(a) Definitions. As used in this clause--

“Priority chemical means a chemical identified by the Interagency Environmental Leadership Workgroup or, alternatively, by an agency pursuant to section 503 of Executive Order 13148 of April 21, 2000, Greening the Government through Leadership in Environmental Management.”

“Toxic chemical means a chemical or chemical category listed in 40 CFR 372.65.”

(b) Executive Order 13148 requires Federal facilities to comply with the provisions of the Emergency Planning and Community Right-to-Know Act of 1986 (EPCRA) (42 U.S.C. 11001-11050) and the Pollution Prevention Act of 1990 (PPA) (42 U.S.C. 13101-13109).

(c) The Contractor shall provide all information needed by the Federal facility to comply with the following:

- (1) The emergency planning reporting requirements of section 302 of EPCRA.
 - (2) The emergency notice requirements of section 304 of EPCRA.
 - (3) The list of Material Safety Data Sheets, required by section 311 of EPCRA.
 - (4) The emergency and hazardous chemical inventory forms of section 312 of EPCRA.
 - (5) The toxic chemical release inventory of section 313 of EPCRA, which includes the reduction and recycling information required by section 6607 of PPA.
 - (6) The toxic chemical, priority chemical, and hazardous substance release and use reduction goals of sections 502 and 503 of Executive Order 13148.
- (End of clause)

52.241-3 SCOPE AND DURATION OF CONTRACT (FEB 1995)

- (a) For an indefinite term, the Contractor agrees to furnish and the Government agrees to purchase **Solar Power** utility service in accordance with the applicable tariff(s), rules, and regulations as approved by the applicable governing regulatory body and as set forth in the contract.
- (b) It is expressly understood that neither the Contractor nor the Government is under any obligation to continue any service under the terms and conditions of this contract beyond the expiration date.
- (c) The Contractor shall provide the Government with one complete set of rates, terms, and conditions of service which are in effect as of the date of this contract and any subsequently approved rates.
- (d) The Contractor shall be paid at the applicable rate(s) under the tariff and the Government shall be liable for the minimum monthly charge, if any, specified in this contract commencing with the period in which service is initially furnished and continuing for the term of this contract. Any minimum monthly charge specified in this contract shall be equitably prorated for the periods in which commencement and termination of this contract become effective.

(End of clause)

52.241-6 SERVICE PROVISIONS (FEB 1995)

- (a) Measurement of service. (1) All service furnished by the Contractor shall be measured by suitable metering equipment of standard manufacture, to be furnished, installed, maintained, repaired, calibrated, and read by the Contractor at its expense. When more than a single meter is installed at a service location, the readings thereof may be billed conjunctively, if appropriate. In the event any meter fails to register (or registers incorrectly) the service furnished, the parties shall agree upon the length of time of meter malfunction and the quantity of service delivered during such period of time. An appropriate adjustment shall be made to the next invoice for the purpose of correcting such errors. However, any meter which registers not more than 0.5 percent slow or fast shall be deemed

correct.

(2) The Contractor shall read all meters at periodic intervals of approximately 30 days or in accordance with the policy of the cognizant regulatory body or applicable bylaws. All billings based on meter readings of less than **N/A** days shall be prorated accordingly.

(b) Meter test. (1) The Contractor, at its expense, shall periodically inspect and test Contractor-installed meters at intervals not exceeding **3** year(s). The Government has the right to have representation during the inspection and test.

(2) At the written request of the Contracting Officer, the Contractor shall make additional tests of any or all such meters in the presence of Government representatives. The cost of such additional tests shall be borne by the Government if the percentage of errors is found to be not more than **0.5** percent slow or fast.

(3) No meter shall be placed in service or allowed to remain in service which has an error in registration in excess of 1 percent under normal operating conditions.

(c) Change in volume or character. Reasonable notice shall be given by the Contracting Officer to the Contractor regarding any material changes anticipated in the volume or characteristics of the utility service required at each location.

(d) Continuity of service and consumption. The Contractor shall use reasonable diligence to provide a regular and uninterrupted supply of service at each service location, but shall not be liable for damages, breach of contract or otherwise, to the Government for failure, suspension, diminution, or other variations of service occasioned by or in consequence of any cause beyond the control of the Contractor, including but not limited to acts of God or of the public enemy, fires, floods, earthquakes, or other catastrophe, strikes, or failure or breakdown of transmission or other facilities. If any such failure, suspension, diminution, or other variation of service shall aggregate more than **N/A** hour(s) during any billing period hereunder, an equitable adjustment shall be made in the monthly billing specified in this contract (including the minimum monthly charge).

(End of clause)

52.252-2 CLAUSES INCORPORATED BY REFERENCE (FEB 1998)

This contract incorporates one or more clauses by reference, with the same force and effect as if they were given in full text. Upon request, the Contracting Officer will make their full text available. Also, the full text of a clause may be accessed electronically at this/these address(es):

<http://farsite.hill.af.mil>

(End of clause)

52.252-6 AUTHORIZED DEVIATIONS IN CLAUSES (APR 1984)

(a) The use in this solicitation or contract of any Federal Acquisition Regulation (48 CFR Chapter 1) clause with an authorized deviation is indicated by the addition of "(DEVIATION)" after the date of the clause.

(b) The use in this solicitation or contract of any Defense Federal Acquisition Regulation Supplement (48 CFR 2) clause with an authorized deviation is indicated by the addition of "(DEVIATION)" after the name of the regulation.

(End of clause)

252.212-7001 CONTRACT TERMS AND CONDITIONS REQUIRED TO IMPLEMENT STATUTES OR EXECUTIVE ORDERS APPLICABLE TO DEFENSE ACQUISITIONS OF COMMERCIAL ITEMS (FEB 2006)

(a) The Contractor agrees to comply with the following Federal Acquisition Regulation (FAR) clause which, if checked, is included in this contract by reference to implement a provision of law applicable to acquisitions of commercial items or components.

☒ 52.203-3 Gratuities (APR 1984) (10 U.S.C. 2207).

(b) The Contractor agrees to comply with any clause that is checked on the following list of Defense FAR Supplement clauses which, if checked, is included in this contract by reference to implement provisions of law or Executive orders applicable to acquisitions of commercial items or components.

☐ 252.205-7000 Provision of Information to Cooperative Agreement Holders (DEC 1991) (10 U.S.C. 2416).

☐ 252.219-7003 Small, Small Disadvantaged and Women-Owned Small Business Subcontracting Plan (DoD Contracts) (APR 1996) (15 U.S.C. 637).

☐ 252.219-7004 Small, Small Disadvantaged and Women-Owned Small Business Subcontracting Plan (Test Program) (JUN 1997) (15 U.S.C. 637 note).

☐ 252.225-7001 Buy American Act and Balance of Payments Program (JUN 2005) (41 U.S.C. 10a-10d, E.O. 10582).

☐ 252.225-7012 Preference for Certain Domestic Commodities (JUN 2004) (10 U.S.C. 2533a).

☐ 252.225-7014 Preference for Domestic Specialty Metals (JUN 2005) (10 U.S.C. 2533a).

☐ 252.225-7015 Restriction on Acquisition of Hand or Measuring Tools (JUN 2005) (10 U.S.C. 2533a).

☐ 252.225-7016 Restriction on Acquisition of Ball and Roller Bearings (JUN 2005) (----- Alternate I) (APR 2003) (10 U.S.C. 2534 and Section 8099 of Public Law 104-61 and similar sections in subsequent DoD appropriations acts).

☐ 252.225-7021 Trade Agreements (FEB 2006) (19 U.S.C. 2501-2518 and 19 U.S.C. 3301 note).

☐ 252.225-7027 Restriction on Contingent Fees for Foreign Military Sales (APR 2003) (22 U.S.C. 2779).

____ 252.225-7028 Exclusionary Policies and Practices of Foreign Governments (APR 2003) (22 U.S.C. 2755).

____ 252.225-7036 Buy American Act--Free Trade Agreements--Balance of Payments Program (JUN 2005) (----
- Alternate I) (JAN 2005) (41 U.S.C. 10a-10d and 19 U.S.C. 3301 note).

____ 252.225-7038 Restriction on Acquisition of Air Circuit Breakers (JUN 2005) (10 U.S.C. 2534(a)(3)).

____ 252.226-7001 Utilization of Indian Organizations, Indian-Owned Economic Enterprises, and Native Hawaiian Small Business Concerns (SEP 2004) (Section 8021 of Public Law 107-248 and similar sections in subsequent DoD appropriations acts).

____ 252.227-7015 Technical Data--Commercial Items (NOV 1995) (10 U.S.C. 2320).

____ 252.227-7037 Validation of Restrictive Markings on Technical Data (SEP 1999) (10 U.S.C. 2321).

____ 252.232-7003 Electronic Submission of Payment Requests (JAN 2004) (10 U.S.C. 2227).

____ 252.237-7019 Training for Contractor Personnel Interacting with Detainees (SEP 2005) (Section 1092 of Pub. L. 108-375).

☒ 252.243-7002 Requests for Equitable Adjustment (MAR 1998) (10 U.S.C. 2410).

____ 252.247-7023 Transportation of Supplies by Sea (MAY 2002) (____ Alternate I) (MAR 2000)
(____ Alternate II) (MAR 2000) (____ Alternate III (May 2002).

____ 252.247-7024 Notification of Transportation of Supplies by Sea (MAR 2000) (10 U.S.C. 2631).

(c) In addition to the clauses listed in paragraph (e) of the Contract Terms and Conditions Required to Implement Statutes or Executive Orders--Commercial Items clause of this contract (Federal Acquisition Regulation 52.212-5), the Contractor shall include the terms of the following clauses, if applicable, in subcontracts for commercial items or commercial components, awarded at any tier under this contract:

252.225-7014 Preference for Domestic Specialty Metals, Alternate I (APR 2003) (10 U.S.C. 2533a).

252.237-7019 Training for Contractor Personnel Interacting with Detainees (SEP 2005) (Section 1092 of Pub. L. 108-375).

252.247-7023 Transportation of Supplies by Sea (MAY 2002) (10 U.S.C. 2631).

252.247-7024 Notification of Transportation of Supplies by Sea (MAR 2000) (10 U.S.C. 2631)

(End of clause)

5352.201-9101 OMBUDSMAN (10 AUG 2005)

(a) An ombudsman has been appointed to hear and facilitate the resolution of concerns from offerors, potential offerors, and others for this acquisition. When requested, the ombudsman will maintain strict confidentiality as to the source of the concern. The existence of the ombudsman does not affect the authority of the program manager, contracting officer, or source selection official. Further, the ombudsman does not participate in the evaluation of proposals, the source selection process, or the adjudication of protests or formal contract disputes. The ombudsman may refer the party to another official who can resolve the concern.

(b) Before consulting with an ombudsman, interested parties must first address their concerns, issues, disagreements, and/or recommendations to the contracting officer for resolution. Consulting an ombudsman does not alter or postpone the timelines for any other processes (e.g., agency level bid protests, GAO bid protests, requests for debriefings, employee-employer actions, contests of [OMBC A-76](#) competition performance decisions).

(c) If resolution cannot be made by the contracting officer, concerned parties may contact the Center/MAJCOM ombudsmen, [Colonel David Glowacki, 130 Douglas Street, Suite 210, Langley AFB VA 23665-2791 \(e-mail: \[David.Glowacki@langley.af.mil\]\(mailto:David.Glowacki@langley.af.mil\)\)](#). Concerns, issues, disagreements, and recommendations that cannot be resolved at the MAJCOM/DRU level, may be brought by the concerned party for further consideration to the Air Force ombudsman, Associate Deputy Assistant Secretary (ADAS) (Contracting), SAF/AQC, 1060 Air Force Pentagon, Washington DC 20330-1060, phone number (703) 588-7004, facsimile number (703) 588-1067.

(d) The ombudsman has no authority to render a decision that binds the agency.

(e) Do not contact the ombudsman to request copies of the solicitation, verify offer due date, or clarify technical requirements. Such inquiries shall be directed to the Contracting Officer.

(End of clause)

5352.223-9000 ELIMINATION OF USE OF CLASS I OZONE DEPLETING SUBSTANCES (ODS) (MAY 1996)

(a) It is Air Force policy to preserve mission readiness while minimizing dependency on Class I Ozone Depleting Substances (ODS), and their release into the environment, to help protect the Earth's stratospheric ozone layer.

(b) Unless a specific waiver has been approved, Air Force procurements:

(1) May not include any specification, standard, drawing, or other document that requires the use of a Class I ODS in the design, manufacture, test, operation, or maintenance of any system, subsystem, item, component, or process; and

2) May not include any specification, standard, drawing, or other document that establishes a requirement that can only be met by use of a Class I ODS;

(c) For the purposes of Air Force policy, the following are Class I ODS:

(1) Halons: 1011, 1202, 1211, 1301, and 2402;

(2) Chlorofluorocarbons (CFCs): CFC-11, CFC-12, CFC-13, CFC-111, CFC-112, CFC-113, CFC-114, CFC-115, CFC-211, CFC-212, CFC-213, CFC-214, CFC-215, CFC-216, and CFC-217, and the blends R-500, R-501, R-502, and R-503; and

(3) Other Controlled Substances: Carbon Tetrachloride, Methyl Chloroform, and Methyl Bromide.

(d) The Air Force has reviewed the requirements specified in this contract to reflect this policy. Where considered essential, specific approval has been obtained to require use of the following substances:
Substance Application/Use Quantity (lbs)

N/A

(e) To assist the Air Force in implementing this policy, the offeror/contractor is required to notify the contracting officer if any Class I ODS not specifically listed above is required in the performance of this contract.

5352.223-9001 HEALTH AND SAFETY ON GOVERNMENT INSTALLATIONS (JUN 1997)

(a) In performing work under this contract on a Government installation, the contractor shall:

(1) Comply with the specific health and safety requirements established by this contract;

(2) Comply with the health and safety rules of the Government installation that concern related activities not directly addressed in this contract;

(3) Take all reasonable steps and precautions to prevent accidents and preserve the health and safety of contractor and Government personnel performing or in any way coming in contact with the performance of this contract; and

(4) Take such additional immediate precautions as the contracting officer may reasonably require for health and safety purposes.

(c) The contracting officer may, by written order, direct Air Force Occupational Safety and Health Standards (AFOSH) and/or health/safety standards as may be required in the performance of this contract and any adjustments resulting from such direction will be in accordance with the Changes clause of this contract.

(d) Any violation of these health and safety rules and requirements, unless promptly corrected as directed by the contracting officer, shall be grounds for termination of this contract in accordance with the Default clause of this contract.

5352.237-9000 CONTROL AND RELEASE OF INSPECTOR GENERAL REPORTS (MAY 1996)

The contractor shall not release any part of an Air Force or Major Air Force Command Inspector General report without the contracting officer's written permission. The contractor shall promptly forward any Freedom of

Information Act (FOIA) request related to an Air Force Inspector General report to the contracting officer for a release determination.

5352.242-9000 CONTRACTOR ACCESS TO AIR FORCE INSTALLATIONS (MAY 2002) (DEVIATION)

(a) The contractor shall obtain base identification and vehicle passes for all contractor personnel who perform work on the Air Force installation(s) cited in the contract. Contractor personnel are required to wear or prominently display installation identification badges and/or, if required by the Contracting Officer, contractor-furnished, contractor identification badges while visiting or performing work on the installation.

(b) At least 15 days prior to required access, the contractor shall submit a written request on company letterhead to the contracting officer listing the following:

- (1) Contract number;
- (2) Location of work site;
- (3) Start and stop dates;
- (4) Subcontractor Firm Name, *if applicable*
- (5) EMPLOYEE PASSES
 - (i) Names (Last, First, Middle and Suffix, if applicable – no nicknames) of employees and subcontractor employees needing access to the base and their
 - (ii) Social security number
 - (iii) Date of birth, and
 - (iv) Driver's license number/state issued
- (6) VEHICLE PASSES
 - (i) Make
 - (ii) Model
 - (iii) Year
 - (iv) Color
 - (v) License number / state issued

(7) By separate letter or in the initial request letter the contractor will also specify the individual(s) authorized to sign future requests for base identification credentials or vehicle passes.

(c) The contracting officer will endorse the request and forward it to the issuing base pass and registration office or security police for processing. Each visitor will be required to stop at the Visitor Control Center (VCC) to obtain a short term pass to enter the site. If a long-term pass (greater than 3 calendar days) is required, each person shall then proceed to the Pass & ID Section (Bldg 20) to obtain the pass. When reporting to the VCC or registration office, the authorized contractor individual(s) must then provide a valid driver's license (with picture), current vehicle registration, and valid vehicle insurance certificate, to obtain a vehicle and/or personnel pass. A background check [e.g., National Crime Institute Center (NCIC)] may be conducted on each employee and vehicle prior to issuance of a pass and/or during the performance period of the contract. Adverse information or failure to consent to such check may result in such individual being prevented from entering the installation.

(d) During performance of the contract, the contractor shall be responsible for obtaining required identification for newly assigned personnel and for prompt return of credentials and vehicle passes for any employee who no longer requires access to the work site. Contractors are further reminded to ensure their employees and those of their subcontractors have the proper credentials allowing them to work in the United States. Persons found to be

undocumented or illegal aliens will be remanded to the proper authorities. The contractor shall not be entitled to any compensation for delays or expenses associated with complying with the provisions of this clause.

(e) When work under this contract requires unescorted entry to controlled or restricted areas, the contractor shall comply with AFI 31-101, Volume 1, *The Air Force Installation Security Program*, and AFI 31-501, *Personnel Security Program Management*, as applicable.

(f) Upon completion or termination of the contract or expiration of the identification passes, the prime contractor shall ensure that all base identification passes issued to employees and subcontractor employees are returned to the issuing office.

(g) Failure to comply with these requirements may result in withholding of final payment.

(End of clause)

Section J - List of Documents, Exhibits and Other Attachments

Exhibit/Attachment Table of Contents

DOCUMENT TYPE	DESCRIPTION	PAGES	DATE
Attachment 1	Land/Area View	3	
Attachment 2	Model Lease Agreement	41	

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APPENDIX E. Q AND A

Photovoltaic Power Site Visit/Pre-Proposal Conference Questions

1. When will the lease agreement be made available?

CONTRACTING OFFICER: Currently the lease agreement is going through various levels of approval. We will notify you as soon as the review process is complete. Once I receive the lease agreement, I will post an update to the RFP on www.fedbizops.gov.

2. What is the REC arrangement with Nevada Power?

CONTRACTING OFFICER: There is no REC arrangement with Nevada Power or any other company for that matter.

3. What Air Force experience requirements are required?

CONTRACTING OFFICER: There is no "Air Force" experience requirement. All we ask is that you provide past performance that is relevant to the particular requirement and that has similar complexity.

4. Is there a union work requirement?

CONTRACTING OFFICER: There is not a union work requirement.

5. When will an extension date for the project be announced?

CONTRACTING OFFICER: We will notify you as soon as the review process is complete.

6. Have there been any other data or drawings shared with other contractors prior to the solicitation?

CIVIL ENGINEER: Copies of all documentation provided to other contractors under previous discussions are being provided on a revised technical library CD.

7. What will be the term of the contract?

CONTRACTING OFFICER: This will be an Indefinite Term contract with a 20-year land lease agreement.

8. Are there any geotechnical subsurface analyses?

ENVIRONMENTAL ENGINEER: Nellis AFB will provide any available data on a revised technical library CD.

9. Are there any hazardous environmental issues related to the landfill?

ENVIRONMENTAL ENGINEER: Nellis AFB is not aware of any hazardous issues. An environmental baseline study and environmental analysis are being conducted and will be provided to the contractor upon completion.

10. Are there any wind load analysis conducted within the site area?

CIVIL ENGINEER: No wind load analysis has been conducted. However, Nellis AFB will provide historical climatological data that includes daily maximum wind speed and direction for the years 2003-2005. This data will be provided on a revised technical library CD.

11. Has the site ever been used as a firing or bombing range?

ENVIRONMENTAL ENGINEER: Nellis AFB is not aware of any instances where the landfill area was used in this manner.

12. Are there any chemicals or toxins within the site area?

ENVIRONMENTAL ENGINEER: Nellis AFB is not aware of any chemical or toxin contamination in the site area.

13. Can products and equipment be railroaded into the AFB?

CIVIL ENGINEER: There is no Air Force restriction on using the rail lines at the site for delivery of equipment and materials. However, any rail deliveries must undergo a security inspection prior to being unloaded to the site.

14. What level of communication access will be allowable on site: satellite, phone, etc.?

CIVIL ENGINEER: We are still researching the answer to this question. However, we believe that cell phones will be allowed.

15. Is the site accessible 24 hours?

CONTRACTING OFFICER: Yes

16. Are there any ordinances to comply with?

1. Ms. Sara Arav-Piper, Nevada Division of Environmental Protection (NDEP), Bureau of Corrective Actions (BCA), has requested to review and comment on the following items (as they pertain to the LF-02 soil cap) prior to construction:

- a. Conceptual Drainage Study IAW Clark County Regional Flood Control District
- b. Grading Plan
- c. Drainage Plan
- d. Footing design and structural loads analysis

2. In accordance with guidance from HQ ACC/A7VR, the following stipulations for construction on/near an Environmental Restoration Program (ERP) site, when known contamination is present, will be met:

- a. This project will comply with NDEP guidance for disposal of contaminated soils/materials.
- b. Contaminated material identified during construction will be removed and disposed using project funds. All soils removed from any ERP site shall require sampling and analysis for disposal purposes. Additionally, the exposed remaining soil (new surface layer) will require sampling and analysis as well. The restoration program manager (RPM) will assist in determining sampling requirements. Note: Any sampling and analysis conducted will be a construction cost. Any excavated area will be backfilled with clean fill, and graded to meet existing conditions.
- c. Construction contractor and site workers will be informed of the potential for encountering contaminated material on the job site. Safety observers currently certified with OSHA 1910.120 Hazardous Waste Operation and Emergency Response (HAZWOPER) training will be on site during construction activities, as necessary.
- d. The contractor will ensure a monitoring program is in place during construction.
- e. The contractor will ensure a site-specific Health & Safety Plan is developed for this project.
- f. The contractor will ensure procedures for decontamination of heavy equipment are established.
- g. The contractor will ensure provisions for safeguarding base personnel and the public (i.e., conspicuous signage, security, air monitoring, etc.) are enforced.
- h. The contractor will ensure an AF Form 103 (Base Civil Engineering Work Clearance Request) is coordinated through 99 CES/CEVR prior to project start-up.

17. Are there any environmental studies available: heat dissipation calculations?

ENVIRONMENTAL ENGINEER: No.

18. Does the 140 acres include storage of materials or does it require a separate location?

CONTRACTING OFFICER: Yes, all storage of materials for this project should be done on the 140 acres provided.

19. Are soil stability analysis available?

ENVIRONMENTAL ENGINEER: No.

20. Are there specific permits or classifications needed by electrical firms to work on base?

CIVIL ENGINEER: No, but the electrical workers will need to be licensed in their field of work. For construction, a dust permit is required and is available with Clark County. For construction, a digging permit is required. The contractor will provide a map of the digging location, mark the location in the field and CE will provide a permit. For construction, a welding permit is required. This permit is issued by the fire department on a same day basis.

21. Is there a required interconnect point?

CIVIL ENGINEER: No. However the interconnection point(s) must not reduce growth capacity of existing feeder circuits. Additionally offerors must submit evidence with their proposals that a request to Nevada Power Company for an Interconnect Agreement has been made, and no contract can be awarded until an Interconnect Agreement with Nevada Power Company is secured.

22. Is there a base site plan in Auto CAD on the CD?

CIVIL ENGINEER: A site plan in AutoCAD format will be will be provided on a revised technical library CD.

23. Is there a site plan for the proposed building site?

CIVIL ENGINEER: A site plan in AutoCAD format will be will be provided on a revised technical library CD.

24. Will some entity at Nellis be the inspecting authority?

CIVIL ENGINEER: Yes. Nellis AFB will provide inspection services.

25. Have any conceptual or pre-design plans been already developed for this project (facility or site)? If so, by whom, and could those plans be available to share with the bidders?

CONTRACTING OFFICER: No.

26. What, if any, environmental considerations or issues have been identified for the project site already?

ENVIRONMENTAL ENGINEER: A portion of this site is located on a landfill with a 24" deep earthen cap. There are no known environmental issues with the landfill site and no other known environmental issues or considerations. Nellis AFB is currently conducting an environmental baseline study and environmental analysis of the site and will provide the results upon completion.

27. Has the site been environmentally cleared?

ENVIRONMENTAL ENGINEER: Nellis AFB is currently conducting an environmental baseline study and environmental analysis of the site and will provide the results upon completion.

28. Have any Geotechs or surveys already been done for this site? If so, can they be provided at this time?

ENVIRONMENTAL ENGINEER: Nellis AFB will provide any available data on a revised technical library CD.

29. Are there any property set-back requirements (from boundary lines)?

CIVIL ENGINEER: The property set back is 15 feet from boundary fence.

30. What is the status of the land justification: i.e., 100% federal control, or does the state share justification for the land?

LEGAL: The land is 100% federally owned and falls under Federal Jurisdictional Code 1, "Exclusive Legislative Jurisdiction".

31. What easements exist on the land (roads, rail lines, utility lines)?

CIVIL ENGINEER: The rail line land runs 50 ft from center line. The utility line set back is 10 ft from center line. The road set back is 10 feet from shoulder. Please use a 20 ft easement from east shoulder along range road.

32. How will the land be conveyed to the lease holder (i.e., “enhanced use lease”, utility easement, etc)?

LEGAL: The land will be conveyed under a land lease agreement.

33. Will Nellis AFB provide Geotech or soils report information? If not, what procedures and policies do the bidders follow to acquire their own soil report?

ENVIRONMENTAL ENGINEER: Limited geotechnical surveys were performed when the landfill wells were drilled. Nellis AFB will provide the data on a revised technical library CD. Offerors wishing to have access to the site to perform their own soil tests may do so by submitting a request to the contracting officer. Email is the preferred form of communication.

34. If any bidders have already acquired soil reports prior to the issuance of the RFP, can all the bidders receive a copy?

CIVIL ENGINEER: Copies of all documentation provided to other contractors under previous discussions are being provided on a revised technical library CD.

35. What is the age, type, and composition of the landfill?

ENVIRONMENTAL ENGINEER: Copies of all documentation relevant to the landfill are being provided on a revised technical library CD.

36. What type of cap does it have? How deep?

ENVIRONMENTAL ENGINEER: The landfill has a 24” deep earthen cap. Copies of all documentation relevant to the landfill are being provided on a revised technical library CD.

37. What are the requirements and policies for penetrating the cap?

ENVIRONMENTAL ENGINEER: The native soil cap may be penetrated to perform construction. However, this project will ensure the landfill cap integrity (i.e. infiltration, drainage, etc.) is maintained.

38. Does the landfill produce methane?

ENVIRONMENTAL ENGINEER: No.

39. Is there caliche in the native soil portion of the land?

CONTRACTING OFFICER: More than likely there is. Southern Nevada is known to have caliche in its soil. There is no way of knowing until the contractor breaks ground.

40. Can the existing fence (or property boundary) be used for PV array security perimeter?

CIVIL ENGINEER: A separate fence boundary for the PV array is required.

41. For the six customer references required in the RFP, it is unclear if Nellis wants past performance data for all six previously installed systems, please confirm.

CONTRACTING OFFICER: Yes, if you have six, please provide data for all six.

42. Please address the rumor: "The power company will be taking over the service to the residential area of the base, along with the hospital?"

CIVIL ENGINEER: A privatization contract for the Nellis AFB family housing was awarded on 1 May 2006. The contract requires the contractor to procure electrical power commercially within 1 year. At that time the family housing load will drop from the base electrical system. No change is anticipated for the hospital and it will remain as a connected load on the base electrical system. Estimates of housing loads have been included in the data library.

43. Where does Nellis prefer the system tied in? During the meeting yesterday, one Nellis representative mentioned there are "two" circuits that feed the base. One feeds the residential bldgs and the other feeds the remaining bldgs. It was our understanding from our conversation that these two feeds were metered separately by Nevada Power and that would require us to split our systems into two circuits that would net-zero both feeds. Since the meeting, we have reviewed the single line and it appears there is only one Nevada Power meter for the whole service. The two circuits are created in the substation and are physically separated in the substations switchgear. Given this information, it appears possible to use either one of the existing circuits (circuit 5 that runs throughout the proposed array location) or use one of the spare sections in the switchgear to supply the entire base with power without the need to split our feed into two circuits. May we do this?

CIVIL ENGINEER: The contractor will decide the most appropriate tie in locations. Your interpretation is correct. The main substation only has one meter and one feed from Nevada Power. Nellis AFB does however, have a small separate Nevada Power feed onto the base which is not located at the main substation and only feeds family housing. The contractor will not be required to supply any family housing areas. You have the option to tie into circuit 5. However, keep in mind that circuits 1-5 are separated from 6-10 by the normally open tie breaker, so I don't know any way the contractor can feed the entire base via only circuit 5.

44. The AFB has recently signed an agreement with NPCo to install separate metering for the residential buildings on base (old circuits 6 & 7). Are there any electrical drawings showing what this modification will look like after its completion?

CIVIL ENGINEER: Actually the housing is on circuits (6 & 9). Circuit (7 & 8) feed the hospital. Nellis AFB has identified locations where circuits (6 & 9) will be disconnected from the family housing. The contractor has yet to provide us with plans on how they will feed the family housing. The feed will come strait from Nevada Power and feed into the housing areas.

45. The metering modification might require a more complex method of interconnection if the base desires to offset both non-residential and residential loads. Please provide any information that will allow us to design a system that will match the AFB's future expansion/modification.

CIVIL ENGINEER: A privatization contract for the Nellis AFB family housing was awarded on 1 May 2006. The contract requires the contractor to procure electrical power commercially within 1 year. At that time the family housing load will drop from the base electrical system. No change is anticipated for the hospital and it will remain as a connected load on the base electrical system. Information on the base future expansion is not available at this time.

46. There is also a bit of confusion about the naming conventions of the circuits. On the single line provided there is reference to "old" circuit names and the current circuit names. Could you please clarify which circuits will be re-metered by NPCo (Kevin mentioned there was talk of circuits 6 & 7 on bus 2 which I assume are the old circuit names).

CIVIL ENGINEER: The housing on Circuits (6 & 9) will be disconnected from the main base load as part of the privatization. I will attach a drawing on the data library which shows the approximate points where the electrical load will be cut.



Environmental

1. Have all environmental clearances been issued?

ENVIRONMENTAL ENGINEER: No, we are currently working the environmental impact analysis process.(EIAP) The draft Environmental Analysis (EA) will be complete before the award date. The Environmental Baseline Study will be finished before the construction start date.

2. What are the environmental constraints outlined in the NEPA documents (i.e. EA)?

ENVIRONMENTAL ENGINEER: For construction, a dust permit is required and is available with Clark County. For construction, a digging permit is required. The contractor will provide a map of the digging location, mark the location in the field and CE will provide a permit. For construction, a welding permit is required. This permit is issued by the fire department on a same day basis. The contractor will provide a storm water permit. Clear materials through HAZMART

3. Have there been any archeology surveys conducted? Any SHPO coordination or monitoring requirements?

ENVIRONMENTAL ENGINEER: Yes to the first question. No, SHPO consultation is complete.

4. Are there any jurisdictional water of the US on site requiring 401/404 permits?

ENVIRONMENTAL ENGINEER: Yes. Jurisdictional waters are on site; these areas would need to be avoided. The contractor will need to consult with the US Army CORPS of Engineers to disturb the drainage.

5. Any wetlands or wetland mitigation requirements?

ENVIRONMENTAL ENGINEER: NO

6. What are the contents of the landfill?

ENVIRONMENTAL ENGINEER: See data library CD "Landfill ERP Waiver".

7. How old is the landfill?

ENVIRONMENTAL ENGINEER: See data library CD "Landfill ERP Waiver".

8. How much settlement has the landfill experienced?

ENVIRONMENTAL ENGINEER: The settlement is undetermined.

Land Survey

1. To prevent encroachments on abutting private properties a property line survey is needed before the fence-line and panel layout can be located. Does such survey exist? If yes, would Nellis AFB furnish same to bidders?

ENVIRONMENTAL ENGINEER: The legal survey will be completed by the time the environmental baseline study (EBS) is finished.

2. A detailed Topographic survey will be needed. Does such survey exist? If yes, would Nellis AFB furnish same to bidders?

ENVIRONMENTAL ENGINEER: Yes, we have a survey with accuracy of up to + or – 2 feet. See data library CD: "Solar_Farm_Elevation_Contour"

3. Are we going to need any land survey legal instruments (i.e. ALTA, Legal descriptions, etc.) to be attached to the land lease?

ENVIRONMENTAL ENGINEER: Yes, Nellis AFB will complete the legal survey.

4. To avoid laying out infrastructure within existing onsite easements, all onsite easements need to be identified. Is any of the onsite easement information available?

ENVIRONMENTAL ENGINEER: Not yet, will be finished once the legal survey is completed.

5. Have all of the existing utilities been located? Does Nellis AFB anticipate any major existing utility relocations or crossing conflicts as part of this project?

CIVIL ENGINEER: All known utilities are included on the data library CD.

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Earthwork

1. Does any geotechnical information detailing existing soil conditions and recommendations regarding bearing capacity, max. cut/fill slopes, unusable materials, organic layer, etc. exist? Any soil percolation data?

CIVIL ENGINEER: We have provided all the geotechnical information that we have on the data library CD and by e-mail.

2. Would Nellis AFB require the hauling of all disturbed unusable materials offsite?

ENVIRONMENTAL ENGINEER: YES

3. Does Nellis AFB have a disposal/borrow site that can be used for this project?

ENVIRONMENTAL ENGINEER: NO

4. What are the foundations design soil-bearing pressures on site and over the landfill?

ENVIRONMENTAL ENGINEER: Unknown

5. What are the cut/fill general grading constraints in working on site and over the landfill?

ENVIRONMENTAL ENGINEER: The contractor should avoid penetrating the landfill material 2 foot cap. Any landfill design will need to be approved by the state Nevada Division of Environmental Protection and Bureau of Corrective Actions (NDEP BCA). It is possible that certain penetrations will be allowed upon approval of the design.

6. Are we restricted in depth or type of foundations for fence or solar panels that can be used over the landfill? If yes, what are the restrictions?

ENVIRONMENTAL ENGINEER: The contractor should avoid penetrating the landfill material 2 foot cap. Any landfill design will need to be approved by the state Nevada Division of Environmental Protection and Bureau of Corrective Actions (NDEP BCA). It is possible that certain penetrations will be allowed upon approval of the design.

7. Would Nellis AFB require any monitoring during the performance of earthwork over or in the vicinity of the landfill?

ENVIRONMENTAL ENGINEER: NO

8. Would Nellis AFB hold contractor responsible for containment measures during construction?

ENVIRONMENTAL ENGINEER: We assume you are talking about storm water containment, if so then NO.

Drainage

1. What are the project drainage design standards (design storm frequency, detention / retention, etc.)?

ENVIRONMENTAL ENGINEER: Use Clark County Regional Flood district standards.

2. Large culverts may be needed convey offsite drainage on or off the Nellis AFB. What is the Anti-Terror / Force-Protection or other perimeter security design criteria (e.g. gates, racks, etc.) or tamper-proof requirements that need to be implemented?

ENVIRONMENTAL ENGINEER: We do not anticipate at this time that the culverts will require special perimeter security design standards.

3. Based on the location of the selected site will there be any FEMA flood plain analysis or mitigation requirements?

ENVIRONMENTAL ENGINEER: NO

4. Does the storm water runoff on or near the landfill need any special handling?

ENVIRONMENTAL ENGINEER: NO. As long as the existing drainage is not disturbed. Procedures will be addressed in the storm water permit. Coordinate w/ John Roe (Water Quality Manager) for the permit.

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5. Do outside state or local agencies have any jurisdiction (review / approval authority) regarding drainage design?

ENVIRONMENTAL ENGINEER: YES

6. Any SWPPP requirements above and beyond standard Best Management practices in and around the site and Landfill?

ENVIRONMENTAL ENGINEER: NO

Electrical

1. Electrical devices emit frequencies, thus possibility of causing interference with the Air Force or other communication systems. Has an analysis been conducted and if so when do you plan release these documents to the bidders? Conversely, if Nellis AFB expects bidders to conduct such an analysis, please provide the criteria required to be met.

CIVIL ENGINEER: NO, we do not expect bidders to conduct such an analysis. However, we would like to know of any interference risks with any new electronic equipment.

2. Have heat dissipation calculations been conducted? Are there specific Nellis AFB driven design requirements based on required heat dissipation?

CIVIL ENGINEER: NO.

3. "Sample Design Specs" were included in the data library. Is it required that the PV installation meet all or any of these specifications?

CIVIL ENGINEER: NO. They were included only as guidelines for design.

4. There are many instances in the National Electrical Code (NEC) where exceptions, variances and "special permission" are granted by the authority having jurisdiction (AHJ). Does the Air Force have any objections to the developer / contractor serving as its own authority having jurisdiction (AHJ)?

CIVIL ENGINEER: YES, we would like to review and approve any variances to the NEC. [TW YES. The base electrical engineer is the AHJ. Any variances to the NEC must be reviewed and approved by the AHJ.]

5. Will the Air Force provide coordination support at the time of interconnection to the 12.5 kV lines? Can the base be off line? For how long? If not, would the developer / contractor be expected to furnish and pay for a backup / alternate?

CIVIL ENGINEER: The base cannot be off line. Outages of individual circuits will be handled on a case by case basis. We have had instances where a single facility cannot be shut down due to mission impact. The base will be onsite for all interconnections to observe the work.

6. Does Nellis AFB have any guidelines or requirements for interconnection to its medium voltage distribution system and if so could those be please provided?

CIVIL ENGINEER: Nellis AFB will individually review and asses each situation.

7. Is there a Supervisory Control And Data Acquisition (SCADA) system or Energy Management System (EMS) on the base and if so would Nellis AFB want the PV SCADA system to tie into it?

CIVIL ENGINEER: Yes we have any Energy Management System (EMS) but we do not require the PV SCADA system to tie into it.

8. What level of communications access will be permitted from the facility? Are there any security concerns or limitations for any of the following?

- a. Connection to telephone landline? Should be no problem but will need to clear through the Communications squadron.
- b. Cell phone link? NO
- c. Satellite uplink? Should be no problem but contractor should clear through the Communications Frequency Management shop

9. What is the demand profile of Bus #1 and Bus #2 of the substation switchgear?

CIVIL ENGINEER: Bus #1 has approximately 80% of the load. Bus #2 has approximately 20% of the load. We cannot provide a demand profile for the two buses. The data library CD includes



the demand profile for the main Nellis AFB substation.

“NELLIS_DEMAND_DATA_MAR05-MAR06 (2)” This includes both Bus #1 and Bus #2 combined.

10. Please describe how Nellis AFB is presently metered by Nevada Power Company.

CIVIL ENGINEER: The main Nellis AFB meter is located at the Nevada Power Substation on the opposite side of Las Vegas BLVD. From there one 3 phase electric line crosses Las Vegas BLVD and enters the Nellis substation. The line then splits with one 3 phase line feeding Transformer #1 and one 3 phase line feeding Transformer #2. For more information please view the one-line diagram provided on the data library CD. The power is metered at 69 KV. From this meter Nevada Power can measure Nellis AFB demand and KWH for billing purposes.

11. Is there a minimum average percentage of Nellis AFB base loads that the PV system must supply? How will this be evaluated if base load fluctuates going forward?

CIVIL ENGINEER: NO. Except for the loss of family housing we anticipate the base load will only increase.

12. What is Nellis AFB regulatory understanding regarding the interconnection standards requirements with Nevada Power Company?

CIVIL ENGINEER: [TW The interconnection standards can be obtained from Nevada Power.]

13. Who is Nellis AFB Nevada Power liaison?

CIVIL ENGINEER: Rick Washburn (702) 367-5422

14. Has Nellis AFB in conjunction with the Nevada Power Company done a study (as is often standard for larger scale projects) for the interconnection requirements for the proposed project to ensure how the system will be connected to the transmission and distribution system?

- If yes could that study be furnished to the bidders?
- If no, will Nellis AFB fund such a study?
- If no, and a study demonstrates that the up-grade or replacement of certain equipment on the Utility network is required, how will the cost of this be reimbursed?

CIVIL ENGINEER: NO. Nellis AFB will not fund such a study. The contractor will be responsible for making sure that the PV Array has no adverse affects to the Nellis AFB electrical distribution system.

General

1. Is the “competitive range” (section B.2.4) presently defined?

Contracting Officer: A competitive range can not be established until bids have been received.

- If so is the range expressed in \$/KWh?
Contracting Officer: The competitive range is based on the ratings of each proposal against all evaluation criteria including \$/KWh.
- In section “M.3.4 Price,” the third sentence refers to, “projected metered output (power).” Is this correct or should this read, “projected metered output (energy)?” [TW It should read “projected metered output (energy)"]
- Does the competitive range incorporate time of use (TOU) considerations? [TW YES]
- Does the competitive range incorporate demand charges? [TW YES]

2. Can you please provide a copy of the site plan in AutoCAD?

CIVIL ENGINEER: The best AutoCAD site plan is located on the data library CD in the “Utility Maps(2)” folder.



Contracting Officer: All bids will be evaluated based on the evaluation factors listed in the RFP. The Power Purchase Agreement Terms and Conditions are not one of the factors.

2. What is Nellis AFB criteria for evaluating alternate renewable energy sources? Would offsite alternates be accepted?

Contracting Officer: The solicitation is only for Photovoltaic arrays. Alternate renewable energy sources will not be accepted at this time. If you would like to use land other than Nellis AFB, we have no objection to that.

3. If there is more land allocated than required for the necessary array power, will the Lessee have permission to use the excess land for other purposes? [TW NO. See lease.]
4. How does Nellis AFB plan to guarantee an off-take for the duration of the Long-Term Power Purchase Agreement? [TW The base will purchase the energy produced by the PV array as defined in the proposal and approved by the Government.]
5. Has there been discussions with Nevada Power concerning the purchasing of the REC's? What is there involvement in the project?

Contracting Officer: There is no agreement between Nevada Power and Nellis AFB for the purchase of the REC's. The winning contractor will be responsible for the sale of the REC's to any third party of their choice. Since Nevada Power is the primary electrical utility provider for Nellis AFB, an interconnect agreement will have to be obtained from them as part of your bid. Anything having to do with their electrical grid located at Nellis AFB will have to coordinated with Nevada Power.



3. Given that the site is in the vicinity of an active airport, what are the height restrictions for construction equipment (cranes, etc.)? Will a FAR Part 77 analysis be required?
Contracting Officer: The FAR only has 53 parts. What do you mean?
4. What are the limitations on construction site access and haul routes? [TW Road access is available via Range Road. Railroad access may be use but must be arranged with Union Pacific and coordinated with the Contracting Officer.]
5. Does Nellis AFB or any other local ordinance provide a restriction on work hours? [TW There are no specific restrictions on work hours, however work hours must be coordinated with the Contracting Officer.]
6. Does Nellis AFB foresee imposing any limitations regarding staging of materials and equipment? [TW All materials and equipment should staged on the project site.]
7. What are the limitations on construction site access and haul routes? [TW Road access is available via Range Road. Railroad access may be use but must be arranged with Union Pacific and coordinated with the Contracting Officer.]
8. Is the railcar system civil or military? [TW The railroad is owned by Union Pacific.]
9. If military does the AFB grant access to railcar system for the project? [TW The government does not own to the rail system.]
10. Can freight/equipment be flown into the base? [TW No]
11. Is storage area for materials, equipment and office equipment all inclusive to project site? [TW YES]
 - a. If so is and it's within AFB, is security required? [TW The Base Security Forces providebase security only for the base and base personnel. The contractor must provide fencing as required in paragraph C.2.3.3. The contractor may provide any additional security he deems necessary. The government accepts no responsibility for security of the work site.]
 - b. If not, is land leased and if so when will land lease documents be released to bidders for this storage area? [TW The site location is on Government land. The land lease was posted on 24 May 2006.]
12. Will the installation be permitted to include a permanent building or structure as a contractor office or control facility? [TW YES]
13. Please describe the present security at the proposed installation site.
 - a. Is the proposed site completely encircled by other portions of Nellis AFB? [TW NO]
 - b. Does the proposed site border private or public land? [TW YES]
 - c. If it is contained within the larger boundary of Nellis, what is the level of security on those bordering portions of the base? [TW Not applicable because the site is not completely contained within the larger boundary of Nellis]
 - d. Is there a specification for approved fencing (as required in C.2.3.3)? [TW The proposed fencing must be submitted to Nellis AFB for approval.]
 - e. How will base security coordinate with Construction security? [TW The contractor should coordinate his security plan with the base security forces. The base will not allow armed security personnel on the site.]
14. When will the land lease be made available to bidders? [TW The land lease was posted on 24 May 2006.]

Contractual

1. The RFP provides for this procurement to be a 'technically acceptable, lowest price' evaluation. How does Nellis AFB intend to evaluate the differences in different bidders' Power Purchase Agreement Terms & Conditions?

1. C.2.3.1 - How long is the term for the ground lease? Please see ground lease model agreement posted on www.fbo.gov
2. Under what conditions may the ground lease be terminated by the Government or contractor? Please see ground lease model agreement posted on www.fbo.gov
3. C.2.2 - Please provide the current power demands for Nellis AFB, peak and baseload, in an electronic format. A spreadsheet containing 15 minute interval electrical meter data covering the period from March 2005 – March 2006 was provided at the site visit on a CD. If you did not attend the site visit and obtain a CD, please provide your mailing address and one will be sent to you.
4. If the ground lease is terminated by the Government, what does the Government expect to happen to the installed power plant? The model lease agreement includes termination conditions.
5. May the Government terminate the ground lease for convenience? The model lease agreement includes termination conditions.
6. May the Government terminate the ground lease for cause? The model lease agreement includes termination conditions.
7. What actions or lack of actions by the Contractor would the Government consider grounds for termination of the ground lease? The model lease agreement included termination conditions.
8. What is the current rate paid by Nellis AFB for electrical power from Nevada Power Company? Please include any savings provisions or penalty provisions of the agreement Nellis AFB has with Nevada Power Company? Nellis purchases electrical service from Nevada Power under rate schedule LGS-X. This tariff is can be found on the Nevada Power web site at <http://www.nevadapower.com/rates/tariffs/schedules/>. The CD handed out at the site visit contains copies in Nevada Power billing statements covering the period from March 2005 – March 2006.
9. Does Nellis AFB have any generating capacity on site? Nellis AFB has only off-line (non-grid connected) back-up generators.
10. Will the ground lease be a part of the contract to purchase power from the contractor? Yes.
11. If the Government terminates the ground lease or agreement to purchase power from the contractor, will the Government reimburse the contractor for unrecovered investment costs of constructing the solar power plant and other site costs? The model lease agreement will include termination conditions/remedies of the parties.
12. Financing for these contracts requires some predictable revenue stream in order to secure favorable rates. What is the minimum time period for the contract to be awarded to the successful offeror to provide power to Nellis AFB? We anticipate an indefinite term contract with a 12-month cancellation notice requirement.
13. Given the short period of time offered by the Government and large amount of proposal material required for proposal development, the RFP would seem to be targeted to vendors or local utilities already in the area or who might have been involved with the drafting of the RFP. Does Nellis AFB have a preference for a local supplier or utility to perform this work? Your assumption is incorrect. No potential vendors, subcontractors, or local utilities were involved in drafting the RFP and Nellis AFB does not have a preference for a local supplier or utility to perform this work.

14. Please provide the names of consultants or contractors who are advising Nellis AFB on this procurement. **All non-government advisors are listed in RFP paragraph L.2.1.4, Use of Non-Government Advisors.**
15. Will the Government indemnify and hold harmless the contractor against all judgments, expenses, etc arising out of actions or activities of Government employees? **Claims for damage caused by government employees are governed by the Federal Tort Claims Act 28 USC 1346(b), 28 CFR Part 14**
16. Please define the small business obligations of the proposer if the proposer is a large business. What percentage of subcontracted work must be awarded to SB, SDB, WOB, etc. to meet Nellis AFB requirements? **There is no small business obligation.**
17. The value of RECs vary substantially. The viability of the business model depends on the sale of the RECs. If market conditions change during the proposal period will the Government allow the contractor to adjust their price accordingly after selecting the apparent winner? **We are not interested in the RECs therefore the price for the RECs do not concern us. We are looking at the total cost per kWh provided to the government and the escalating factor that you propose. This contract will be a Firm Fixed Price contract.**
18. If market conditions for RECs or electricity change during the construction period will the Government allow the contractor to adjust their pricing? **No. Offers should contain a firm fixed price with an escalating factor.**
19. Access to the technical library in person only is an unreasonable set of bid conditions and favors local contractors or utilities. It is a limiting condition. It is normal for the technical library to be in an electronic format. Please scan the technical library and post it on the internet so all competitors may have equal access. **The entire technical library has been converted to electronic format. The contents of this CD will not be posted on www.fbo.gov, but can be provided via mail. Please provide your mailing address and I will have the CD forwarded to you.**
20. Given the nature of this project, complexity of planning, applications required, etc. we request a 45 day extension on the bid date. **Currently there are no plans to extend the RFP by 45 days, however it has been extended until 16 Jun 2006.**
21. How far is the Nevada Power Company interconnect point from the property designated for the location of the PV Array? **That information is on the Data CD**
22. Will the contractor receive a ground lease for the area needed for transmission lines needed to connect to Nevada Power? **The PV array will not be connected to Nevada Power lines, but to the Nellis AFB owned electrical system.**
23. If a security lockdown of the base occurs, will our employees still be allowed to enter the site? **No, unless you are needed to perform work in your area for security reasons. The base Security Forces will have discretion over this area.**
24. Please provide a complete description including equipment, line sizes, etc. of the base electrical distribution system as referenced in C.2.3.2. **All Available information is contained on the CD.**
25. Please provide all records of past power quality issues such as surge, undervoltage, overvoltage, harmonics, voltage sag, or voltage swell that have affected Nellis AFB and the frequency of those problems. **We do not have any records of these types of power issues. Our power factor is indicated on the Nevada Power bill included on the data cd.**
26. The Air Force has the authority to enter into agreements to purchase energy for periods up to 30 years.

How long (in years) will the agreement with the Government to purchase electricity from the contractor be in effect for this procurement? **We anticipate awarding an indefinite term contract.**

27. Section M.3.4 says the evaluation of proposals will be based on the stream of monthly payments over the term of land use document period. Section M3.4.3 states the Air Force may enter into contracts for up to 30 years for the purchase of energy but without reference to the land use document. Is the land use document separate from the agreement to purchase electricity? **Yes. For the purposes of evaluation, it will be assumed that the indefinite utility agreement for the purchase of power will be extended annually for as long as the land lease is in effect. The lease term is expected to be 20 years .**

28. Paragraph M.2.1 states "A detailed evaluation will be performed on each proposal submitted." However, Paragraph M.2.1.1 states "If no responsive proposals are received the government may at its discretion consider technically acceptable alternate proposals". Please clarify this apparent conflict and verify that an alternate proposal under L.6.2 will receive a detailed evaluation as stated in Paragraph M.2.1 and not be placed in a secondary evaluation position, ie. considered only if "no responsive proposals" are submitted. **It is the intention of the Air Force to award a contract under the terms and conditions of the RFP. As such we do not intend to perform a full evaluation of alternate (non-conforming) proposals if technically acceptable, conforming proposals are received. Implicit in the words of paragraph M.2.1 is that a proposal must be conforming to be evaluated. The specific requirements for FAR 15.305 are that "An agency shall evaluate competitive proposals". By definition an alternate proposal is not competitive and the Air Force is not obliged to perform an evaluation. We do, however, reserve the option to evaluate alternate proposals if no technically acceptable, conforming proposals are received.**

Questions - Solicitation # FA4861-06-R-B501

1. RFP Page 38, Paragraph L.5, Proposal Preparation Instructions – Volume II: Past Performance does not reference RFP Page 41, Attachment 1: Past Performance Information or give instructions regarding the completion and incorporation of Attachment 1 into Volume II. However, RFP Page 47, Paragraph M.3.3 Past Performance references Attachment 1 and states, “In evaluating this factor, the Government will use the present and past performance information gathered from offeror-provided references (Section L, Attachment 1)”. Please clarify that Past Performance information requested by Paragraph M.3.3 and provided on Attachment 1 is the same, or in addition to, the Past Performance references requested by Paragraph L.5.. Also, are completed Attachment 1: Past Performance Information sheets to be placed in the Volume II submittal with the Past Performance project information and references provided in response to Paragraph L.5. or placed elsewhere in the proposal.

Answer: Past Performance information requested by Paragraph M.3.3 and provided on Attachment 1 is the same as the Past Performance information requested by Paragraph L.5. Past Performance Information sheets shall be included in Volume II, Past Performance.

2. Attachment 1, item A refers to an “Organizational Structure Change History”. However, neither Paragraph L.5, Proposal Preparation Instructions – Volume II: Past Performance or Paragraph M.3.3, Past Performance has any reference to a requirement for an Organizational Structure Change History. Please clarify.

Answer: In Volume II describe the history of any organizational structure changes as necessary to support the relevance of past performance references which may not otherwise be obviously attributed to the offeror. There is no specific format for this information. Simply provide direct, frank, concise descriptions for the pertinent organizational changes.

3. The solicitation (Paragraph L.5 and M.3.3) implies that Past Performance references for “. . . proposed subcontractors that will be performing a significant portion of the work and for each firm participating in a joint venture or teaming arrangement” will be evaluated for each offeror’s proposal. Please clarify what level of documentation is required to adequately demonstrate a contractual arrangement (Letter of Intent/Commitment, Teaming Agreement, etc.) exists between the prime and proposed subcontractors, team members, or joint venture participants.

Answer: The offeror’s proposal should state upfront if the proposal is a joint venture, teaming arrangement, LLC, etc and describe the arrangement. Provide all pertinent documents, legal instruments and/or letters that have been issued, executed or signed. Letters of Intent/Commitment will be considered in the evaluation of the proposal.

4. The solicitation (Paragraph L.5) requires submission of past performance information on “. . . photovoltaic (solar power) projects . . . “. As Photovoltaic is only one form of solar power, is past performance information being requested for only photovoltaic projects or any solar technology?

Answer: This solicitation is for electrical power produced by a photovoltaic array and past performance with photovoltaic projects will be considered more relevant than past performance on projects using other solar technologies.

5. Regarding past performance references (Paragraph L.5), the Offeror is to provide references for up to 6 of its largest projects of similar scope. The Offeror is also to provide references for any proposed subcontractors performing significant portions of the work and for each firm participating in a joint venture or teaming arrangement. Is the Offeror limited to a total of 6 references including subcontractors and JV/team firms, or may additional references be submitted for each significant subcontractor and JV/team firm? If additional references may be submitted, is there a limit to the number of references, either overall or for each significant subcontractor or JV/team firm?

Answer: The Air Force recognizes joint ventures, teaming arrangements, etc as a single offeror and, as such, the Air Force will only review and evaluate the first six references provided in the offerors proposal. Provide subcontractor references in addition to the six offeror references to support the subcontractor's qualifications.

6. At the site visit it was stated that a proposed lease document would be provided for review by potential offerors once higher headquarters approval of the document was received, and the RFP response due date would be extended for a period of time equal to the time required to obtain an approved lease document. When will the proposed lease document be distributed and are we correct to assume the proposal due date will be extended beyond 31 May?

Answer: Amendment 2, posted on 24 May 2006, included an extension of the proposal due date until 16 Jun 2006 and the Model Lease Agreement.

7. What is the relationship of the forthcoming land lease and the contract that will be executed as a result of solicitation FA4861-06-R-B501 and how will the two documents interface?

Answer: The land lease and indefinite term contract are separate documents and only related by reference in each document.

8. The RFP is silent as to the course of action the Government will pursue should there be a shortfall of estimated contract deliveries in any given year. Will that be addressed in the lease document or is the power being contracted on a "best efforts" basis?

Answer: The Air Force will purchase the power produced by the PV array and delivered to the Nellis AFB electrical distribution system. The successful offeror is expected to make a best effort to produce power at the rate proposed and there is no shortfall penalty defined in the RFP. However, consistent failure to produce power at the rate proposed could be considered as default.

9. What is the contractual obligation of the Government regarding the purchase of power generated by the PV array? Will the Government be obligated to purchase all of the power or only a guaranteed monthly minimum?

Answer: The base will purchase the energy produced by the PV array as defined in the proposal and approved by the Government on a best effort basis. The Government does not intend to guarantee a monthly minimum purchase.

10. Paragraph C.2.2 requires completion of all construction within 24 months of contract award. Are there liquidated damages should there be delays in construction?

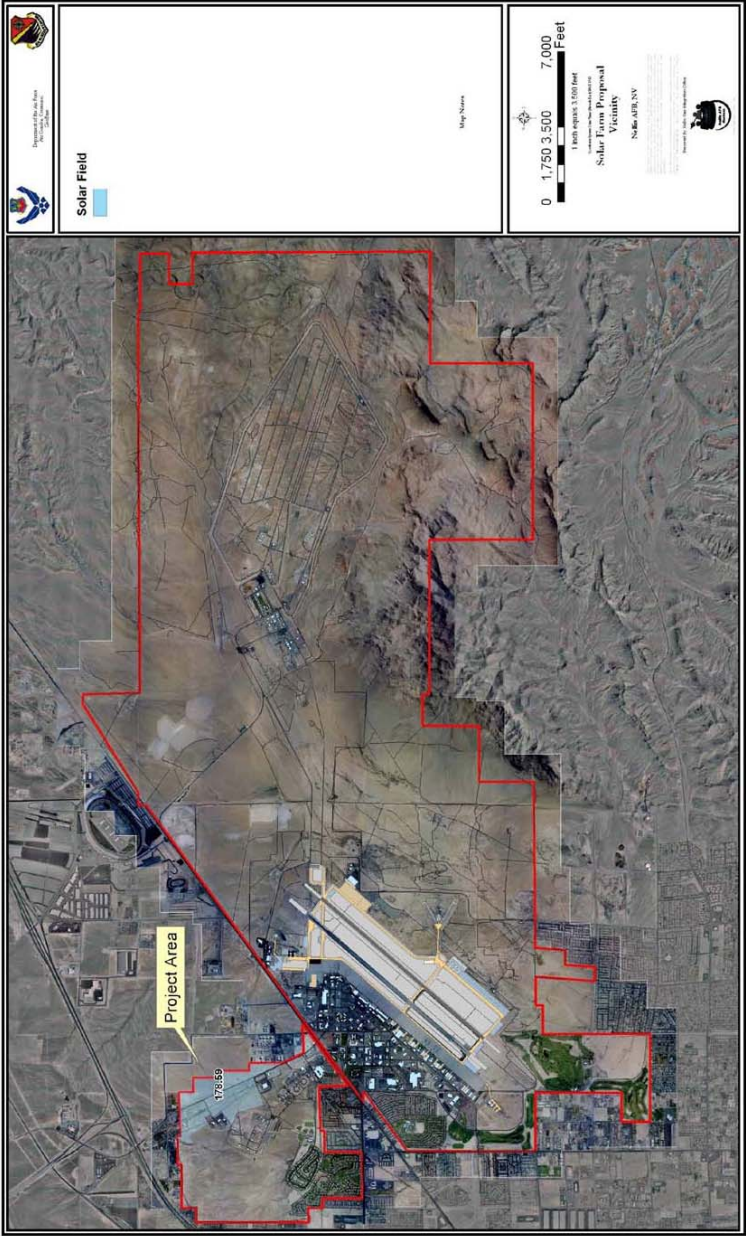
Answer: No. However, unreasonable delay in completing the construction could be considered as default.

11. Reference the requirement to complete all construction work within 24 months of contract award in paragraph C.2.2. Would the Air Force entertain delaying the construction phase should the contractor be able to offer financial incentives to do so?

Answer: The Air Force would consider a delayed construction schedule. However, this would be considered a deviation/alternate proposal and must be identified as such.

APPENDIX F. LAND AERIAL VIEW

Attachment 1
FA4861-06-D-B500



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APPENDIX G. AMENDMENTS

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT			1. CONTRACT ID CODE J		PAGE OF PAGES 1 2	
2. AMENDMENT/MODIFICATION NO. 0001		3. EFFECTIVE DATE 10-May-2006		4. REQUISITION/PURCHASE REQ. NO.		
6. ISSUED BY 99 CONSLOGCB2 5506 SWANAB BLVD (BLD G 550) NELLIS AFB NV 89191-7063		CODE FA4861		7. ADMINISTERED BY (If other than item 6) See Item 6		
8. NAME AND ADDRESS OF CONTRACTOR (No., Street, County, State and Zip Code)				9A. AMENDMENT OF SOLICITATION NO. FA4861-06-R-6501		
				9B. DATED (SEE ITEM 11) 18-Apr-2006		
				10A. MOD. OF CONTRACT/ORDER NO.		
				10B. DATED (SEE ITEM 13)		
CODE				FACILITY CODE		
11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS						
<input checked="" type="checkbox"/> The above numbered solicitation is amended as set forth in Item 14. The hour and date specified for receipt of Offer <input checked="" type="checkbox"/> is extended, <input type="checkbox"/> is not extended. Offer must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation or as amended by one of the following methods: (a) By completing Items 8 and 15, and returning 1 copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.						
12. ACCOUNTING AND APPROPRIATION DATA (If required)						
13. THIS ITEM APPLIES ONLY TO MODIFICATIONS OF CONTRACTS/ORDERS. IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.						
A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: (Specify authority) THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A.						
B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as changes in paying office, appropriation data, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(B).						
C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:						
D. OTHER (Specify type of modification and authority)						
E. IMPORTANT: Contractor <input type="checkbox"/> is not, <input type="checkbox"/> is required to sign this document and return _____ copies to the issuing office.						
14. DESCRIPTION OF AMENDMENT/MODIFICATION (Organized by UCF section headings, including solicitation/contract subject matter where feasible.) Change to the contractor proposal due date.						
Except as provided herein, all terms and conditions of the document referenced in Item 9A or 10A, as heretofore changed, remain unchanged and in full force and effect.						
15A. NAME AND TITLE OF SIGNER (Type or print)				16A. NAME AND TITLE OF CONTRACTING OFFICER (Type or print)		
				TEL: _____ EMAIL: _____		
15B. CONTRACTOR/OFFEROR		15C. DATE SIGNED		16B. UNITED STATES OF AMERICA		16C. DATE SIGNED
(Signature of person authorized to sign)				BY _____		10-May-2006
				(Signature of Contracting Officer)		

EXCEPTION TO SF 30
APPROVED BY OIRM 11-84

30-105-04

STANDARD FORM 30 (Rev. 10-83)
Prescribed by GSA
FAR (48 CFR) 53.243

SECTION SF 30 BLOCK 14 CONTINUATION PAGE

SUMMARY OF CHANGES

SECTION A - SOLICITATION/CONTRACT FORM

The required response date/time has changed from 18-May-2006 02:00 PM to 31-May-2006 02:00 PM.

(End of Summary of Changes)

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT			1. CONTRACT ID CODE	PAGE OF PAGES
			J	1 2
2. AMENDMENT/MODIFICATION NO. 0002	3. EFFECTIVE DATE 24-May-2006	4. REQUISITION/PURCHASE REQ. NO.		5. PROJECT NO. (If applicable)
6. ISSUED BY 99 CONS/LGCB/2 5865 SWAAB BLVD (BLDG 586) NELLIS AFB NV 89191-7063	CODE FA4861	7. ADMINISTERED BY (If other than item 6) See Item 6		
8. NAME AND ADDRESS OF CONTRACTOR (No., Street, County, State and Zip Code)		9A. AMENDMENT OF SOLICITATION NO. FA4861-06-R-B501 9B. DATED (SEE ITEM 11) 18-Apr-2006 10A. MOD. OF CONTRACT/ORDER NO. 10B. DATED (SEE ITEM 13)		
CODE		FACILITY CODE		
11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS				
<input checked="" type="checkbox"/> The above numbered solicitation is amended as set forth in Item 14. The hour and date specified for receipt of Offer <input checked="" type="checkbox"/> is extended, <input type="checkbox"/> is not extended. Offer must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation or as amended by one of the following methods: (a) By completing Items 8 and 15, and returning 1 copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.				
12. ACCOUNTING AND APPROPRIATION DATA (If required)				
13. THIS ITEM APPLIES ONLY TO MODIFICATIONS OF CONTRACTS/ORDERS. IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.				
A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: (Specify authority) THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A.				
B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as changes in paying office, appropriation date, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(B).				
C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:				
D. OTHER (Specify type of modification and authority)				
E. IMPORTANT: Contractor <input type="checkbox"/> is not, <input type="checkbox"/> is required to sign this document and return _____ copies to the issuing office.				
14. DESCRIPTION OF AMENDMENT/MODIFICATION (Organized by UCF section headings, including solicitation/contract subject matter where feasible.) Extend proposal due date and add attachment 2, Model Lease Agreement.				
Except as provided herein, all terms and conditions of the document referenced in Item 9A or 10A, as heretofore changed, remains unchanged and in full force and effect.				
15A. NAME AND TITLE OF SIGNER (Type or print)		16A. NAME AND TITLE OF CONTRACTING OFFICER (Type or print)		
		TEL: David Robledo		
15B. CONTRACTOR/OFFEROR	15C. DATE SIGNED	16B. UNITED STATES OF AMERICA	16C. DATE SIGNED	
(Signature of person authorized to sign)		BY David Robledo	24-May-2006	
		(Signature of Contracting Officer)		

EXCEPTION TO SF 30
APPROVED BY OIRM 11-84

30-105-04

STANDARD FORM 30 (Rev. 10-83)
Prescribed by GSA
FAR (48 CFR) 53.243

SECTION SF 30 BLOCK 14 CONTINUATION PAGE

SUMMARY OF CHANGES

SECTION A - SOLICITATION/CONTRACT FORM

The required response date/time has changed from 31-May-2006 02:00 PM to 16-Jun-2006 12:00 PM PST.

SECTION J - LIST OF DOCUMENTS, EXHIBITS AND OTHER ATTACHMENTS

The Table of Contents has changed from:

Exhibit/Attachment Table of Contents

DOCUMENT TYPE	DESCRIPTION	PAGES	DATE
Attachment 1	Land/Area View		

to:

Exhibit/Attachment Table of Contents

DOCUMENT TYPE	DESCRIPTION	PAGES	DATE
Attachment 1	Land/Area View		
Attachment 2	Model Lease Agreement		

(End of Summary of Changes)

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT				1. CONTRACT ID CODE J	PAGE OF PAGES 1 13
2. AMENDMENT/MODIFICATION NO. 0003		3. EFFECTIVE DATE 06-Jun-2006		4. REQUISITION/PURCHASE REQ. NO.	
5. PROJECT NO. (If applicable)					
6. ISSUED BY 99 CONS/LGCB/2 5865 SWAAB BLVD (BLDG 586) NELLIS AFB NV 89191-7063		7. ADMINISTERED BY (If other than item 6) See Item 6		CODE	
8. NAME AND ADDRESS OF CONTRACTOR (No., Street, County, State and Zip Code)				X 9A. AMENDMENT OF SOLICITATION NO. FA4861-06-R-B501	
				X 9B. DATED (SEE ITEM 11) 18-Apr-2006	
				10A. MOD. OF CONTRACT/ORDER NO.	
				10B. DATED (SEE ITEM 13)	
CODE				FACILITY CODE	
11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS					
<input checked="" type="checkbox"/> The above numbered solicitation is amended as set forth in Item 14. The hour and date specified for receipt of Offer <input type="checkbox"/> is extended, <input checked="" type="checkbox"/> is not extended. Offer must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation or as amended by one of the following methods: (a) By completing Items 8 and 15, and returning _____ copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.					
12. ACCOUNTING AND APPROPRIATION DATA (If required)					
13. THIS ITEM APPLIES ONLY TO MODIFICATIONS OF CONTRACTS/ORDERS. IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.					
A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: (Specify authority) THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A.					
B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as changes in paying office, appropriation date, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(B).					
C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:					
D. OTHER (Specify type of modification and authority)					
E. IMPORTANT: Contractor <input type="checkbox"/> is not, <input type="checkbox"/> is required to sign this document and return _____ copies to the issuing office.					
14. DESCRIPTION OF AMENDMENT/MODIFICATION (Organized by UCF section headings, including solicitation/contract subject matter where feasible.) Add additional paragraph to Section L (refer to Section L.7.6.2.)					
Except as provided herein, all terms and conditions of the document referenced in Item 9A or 10A, as heretofore changed, remains unchanged and in full force and effect.					
15A. NAME AND TITLE OF SIGNER (Type or print)				16A. NAME AND TITLE OF CONTRACTING OFFICER (Type or print) TEL: <i>David Robledo</i> EMAIL: <i>David.Robledo@hqs.gov</i>	
15B. CONTRACTOR/OFFEROR (Signature of person authorized to sign)		15C. DATE SIGNED		16B. UNITED STATES OF AMERICA BY: <i>David Robledo</i> (Signature of Contracting Officer)	
				16C. DATE SIGNED 06-Jun-2006	
EXCEPTION TO SF 30 APPROVED BY OIRM 11-84		30-105-04		STANDARD FORM 30 (Rev. 10-83) Prescribed by GSA FAR (48 CFR) 53.243	

SECTION SF 30 BLOCK 14 CONTINUATION PAGE

SUMMARY OF CHANGES

SECTION L - INSTRUCTIONS, CONDITIONS AND NOTICES TO BIDDERS

The following have been modified:
INSTR, CONDIT., NOTICE TO BIDD

SECTION L
Instructions, Conditions, and Notices to Offerors

L.1 52.252-1: Solicitation Provisions Incorporated by Reference (IAW FAR 52.107[a])

This solicitation incorporates one or more solicitation provisions by reference, with the same force and effect as if they were given in full text. Upon request, the Contracting Officer will make their full text available. The Offeror is cautioned that the listed provisions may include blocks that must be completed by the Offeror and submitted with its quotation or offer. In lieu of submitting the full text of those provisions, the Offeror may identify the provision by paragraph identifier and provide the appropriate information with its quotation or offer.

The full text of a solicitation provision may be accessed electronically at these addresses: <http://farsite.hill.af.mil> (all provisions) and <http://www.arnet.gov/far>.

The following FAR and DFAR clauses are incorporated by reference:

Paragraph	Clause Title	Date
52.204-6	Data Universal Numbering System (DUNS) Number (IAW FAR 4.603[a])	Jun 1999
52.211-14	Notice of Priority Rating for National Defense Use (IAW FAR 11.604[a]) For the purposes of this provision, the blanks are completed on the cover sheet.	Sep 1990
52.215-1	Instructions to Offerors—Competitive Acquisitions (IAW FAR 15.209[a])	Feb 2000
52.215-1	Alt I (IAW FAR 15.209[a][1])	Oct 1997
52.215-1	Alt II (IAW FAR 15.209[a][2])	Oct 1997
52.215-16	Facilities Capital Cost of Money (IAW FAR 15.408[h])	Oct 1997
52.215-20	Requirement for Cost or Pricing Data or Information other than Cost or Pricing Data (IAW FAR 15.408[l])	Oct 1997
52.215-20	Alt IV	Oct 1997

Paragraph	Clause Title	Date
52.216-1	(IAW FAR 15.408[1][4]) Type of Contract (IAW FAR 16.105)	Apr 1984
52.222-24	Pre-award On-Site Equal Opportunity Compliance (Evaluation) (IAW FAR 22.810[c])	Feb 1999
52.233-2	Service of Protest (IAW FAR 33.106[a])	Aug 1996
52.237-1	Site Visit (IAW FAR 37.110[a])	Apr 1984
52.252-5	Authorized Deviations in Provisions (IAW FAR 52.107[e]) (a) IAW AFFARS use in this solicitation of any federal acquisition regulation (48 CFR Chapter 1) provision with an authorized deviation is indicated by the addition of "(deviation)" after the date of the provision. (b) IAW AFFARS use in this solicitation of any defense federal acquisition regulation supplement (48 CFR Chapter 2) provision with an authorized deviation is indicated by the addition of "(deviation)" after the name of the regulation.	Apr 1984
252.204-7001	Commercial and Government Entity (CAGE) Code Reporting (IAW DFARS 204.602-70)	Aug 1999
5352.215-9001	Notice of Pre-Proposal Conference (IAW AFFARS 5315.210) (a) A pre-proposal conference will be conducted on 2 May 06 for the purpose of answering questions regarding this solicitation. Prior to the pre-proposal conference the government will provide a tour of the site where the solar array will be constructed. At the time of the site visit, contractors can request a copy of the site map, which will be located in the technical library. (b) Submit the names of all attendees (not to exceed 3 attendees per company) to David Robledo at david.robledo@nellis.af.mil by 24 Apr 06. (c) Offerors are requested to submit questions to David Robledo at david.robledo@nellis.af.mil no later than 5 May 06.	May 1996

L.2 Information to Offerors

L.2.1 General Information

L.2.1.1 Point of Contact

The Procuring Contracting Officer (PCO) is the sole point of contact for this acquisition. Address any and all questions or concerns in writing to the PCO:

Name: David Robledo

Address: 5865 Swaab Blvd Bldg 588

City, State, Zip Code: Nellis AFB, NV 89191-7063

Fax no: 702-652-9570

E-mail: david.robledo@nellis.af.mil

L.2.1.2 Debriefings

All Offerors may request debriefings by providing a written request to the PCO at the address located in Block 8 of SF 33 within 3 calendar days after receiving notification from the PCO of elimination from the competitive range or award of contract. To the maximum extent practicable, debriefings will be conducted within 5 days of the debriefing request.

L.2.1.3 Discrepancies

If an Offeror believes that the requirements in these instructions contain an error or omission, or are otherwise unsound, the Offeror shall immediately notify the PCO in writing with supporting rationale.

L.2.1.4 Use of Non-Government Advisors

Offerors are advised that data submitted to the Government in response to this solicitation may be released to non-government advisors for review and analysis. These advisors may be required to provide advice within their area of expertise regarding proposal strengths, weaknesses, inadequacies, risks, and deficiencies. Non-government advisors will be subject to civil and criminal penalties associated with any release of information pursuant to FAR Part 3.104 procurement integrity violations. They will not determine ratings or rankings of Offerors' proposals.

If the Offeror has any objection to non-government advisor access to their proposal information, the Offeror shall provide grounds and justification for their objections. The non-government advisors are:

Thomas E. White, P.E.	S&A Environmental Consults
Brent Smeltzer	Northrop Grumman

Note: The companies listed above may not assist or participate in preparation or submission of any proposal associated with this acquisition.

L.2.1.5 Site Visits

Site visit will begin at 99 CONS: 5865 Swaab Blvd, Bldg 588, Nellis AFB, NV 89191 on 2 May 06 at 0900. Confirmation of attendance needs to be verified in writing no later than 24 Apr 06. Offerors may schedule additional site visits by contacting the PCO.

L.2.1.6 Technical Library

A Technical Library will be available from the date of posting until the proposal due date for Offerors to view data that is not available in electronic format. Offerors should contact the PCO to arrange entrance into the Library.

L.2.1.7 Evidence of Responsibility

To be determined responsible, an Offeror must be, and demonstrate that he is capable of providing renewable utility service (solar power) requirements substantially similar to those identified in Section C, *Description/Specifications/Work Statement*. The Offeror must demonstrate an ability to provide the required services to the Government during the entire term of the proposed contract.

L.2.1.8 Proprietary Information

Information deemed by the Offeror to be proprietary shall be clearly marked as proprietary information and, where possible, shall be separated and provided in separate sealed envelopes for each technical proposal and price/cost proposal. Proposals submitted in response to this solicitation will not be returned. The Government will destroy any extra copies under proper security procedures.

L.2.1.9 Period of Validity

The proposal shall be valid for **150 days** from the required submission date.

L.2.2 Number of Awards

There will be a single award resulting from this solicitation.

L.3 Proposal Preparation Instructions – General

This section provides general guidance for preparing proposals, as well as specific instructions on the format and content of the proposal. The Offeror's proposal must include all data and information requested by these instructions and must be submitted in accordance with these instructions. The Offeror shall comply with the requirements as stated in Section B, *Supplies or Services and Prices/Costs*, and Section C, *Description/Specifications/Work Statement*.

This Request for Proposal includes access to the property which is through a separate land use document.

The Government will read/evaluate only the maximum number of pages allowed. Nonconformance with the specified organization, content, and page limitations may be cause for proposal rejection.

L.3.1 Proposal Organization/Page Limits

Offerors shall prepare the proposal as set forth in the table below. The titles, contents, and page limits of each volume shall be as described in the table below. The contents of each proposal volume are described in the paragraph noted in the table.

Volume	Paragraph Number	Title	Maximum Page Limit
I		Technical Proposal (Written)	200
II		Past Performance	40
III		Contract Documentation	None
IV		Price Proposal	None

L.3.2 Proposal Format

The proposal shall be clear and concise, and shall include sufficient detail for effective evaluation and for substantiating the validity of stated claims. The proposal shall not simply restate or rephrase the Government's requirements, but rather provide convincing rationale to address how the Offeror intends to meet these requirements. Offerors shall assume that the Government has no prior knowledge of their facilities and experience, and will base its evaluation on the information presented in the Offerors proposal.

Each volume shall be written on a stand-alone basis so that its contents may be evaluated without cross-referencing.

Elaborate graphics, multi-media functions (for example, video clips or sound bites), or other embellishments are unnecessary and are not desired. Limit pictures in the electronic proposal to the cover page only and limit graphics to only those conveying data integral to the proposal.

L.3.3 Distribution

Offeror shall submit an original and four hard copies in three-ring binders and three additional copies on a CD-ROM.

L.3.4 Electronic Media

Offeror shall submit their electronic proposals on CD ROM disks. All volumes shall be submitted on one CD. With the exception of the Price proposal, Offeror shall submit proposal files in the *Adobe* Portable Document File (PDF) format that is text searchable and with a table of contents (roadmap) of the proposal structure. The Offeror shall provide appropriate *bookmarks* and *thumbnails*. The minimum requirement for hypertext link is a table of contents linked to each file provided in the proposal. Additional hypertext links within the proposal are at the Offeror's discretion.

The Price Volume shall be submitted in application-specific files developed and saved using the following versions of Microsoft software: *Word 2000*, *Excel 2000*, *PowerPoint 2000*, and *Windows 98*, or later versions. Each CD shall contain an electronic label, which is to be established on a CD when the CD is formatted. No password-protected, zipped, or self-extracting files shall be used.

Each Offeror shall provide virus-free CDs and shall certify that they are *virus free*. Be sure to identify appropriate markings such as the legend at FAR 52.215-1(e), *Restriction on Disclosure and Use of Data*.

L.3.5 Pages and Typing

Page size shall be 8½ by 11 inches (*Word for Windows* portrait format) or 11 by 8½ inches (*Word for Windows* landscape format). Landscape pages may be used only for large tables, charts, graphs, and diagrams, not for pages of text. Page size 11 by 17 inches may only be used for tables, figures/diagrams, illustration/drawings, and maps. Pages sized 11 by 17 inches will be counted as two pages.

Text shall be single-spaced, in 11-point Arial font. Arial font size of 10 point may be used for tables, captions, matrices, maps, and header and footer information. For charts, graphs, and figures/diagrams, the font shall be no smaller than 5 point. Use at least 1-inch margins on the top and bottom and 1-inch side margins. Pages will be numbered sequentially by volume. These page format restrictions shall also apply to responses to any Evaluation Notices.

Page limitations shall be treated as maximums. If exceeded, excess pages will not be read or considered in the evaluation of the proposal.

Each page shall be counted except for the following: cover pages, table of contents, cross-reference matrix, tabs, and glossaries.

L.3.6 Change Pages

The Government intends on submitting Evaluation Notices electronically. In response to the Evaluation Notices, change pages shall be submitted for the electronic copies of the proposal volumes.

In the upper right corner of each change page, include the Offeror name, exact location (volume, section, page number, etc.) within the original proposal, date of transmittal, and applicable Evaluation Notice document control number assigned by the source-selection team. A change bar in the margin to indicate the changed part of each page shall mark changes.

L.3.7 Cost or Pricing Information

Cost or pricing information should mainly be addressed in the price proposal and contract documentation volumes. Cost trade-off information, work-hour estimates, and material kinds and quantities may be used in other volumes as appropriate for presenting rationale for alternatives or design and trade-off decisions.

L.3.8 Cross-Reference Matrix

The Offeror shall provide a cross-reference matrix. The purpose of this matrix is to aid the Government's evaluation of the proposals, thereby ensuring no requirements have been overlooked. Offerors shall cross reference the offer and Section C, *Description/ Specifications / Work Statement*, to where each is addressed.

L.3.9 Glossary of Abbreviations and Acronyms

If appropriate, each volume may contain a glossary of all abbreviations and acronyms, with an explanation for each. Glossaries will not count against the page limitations for their respective volumes.

L.4 Proposal Preparation Instructions – Volume I: Technical Proposal

The Technical Proposal Volume should be specific and complete. A separate Volume I must be submitted for the renewable utility service (solar power) included in the proposal. In order to evaluate the technical proposals strictly on the merits of the material submitted, no contractual price information shall be included in the technical proposals.

The technical proposal shall describe the Contractor's capability to provide the level of renewable utility service required by this contract. It should be specific and complete in every detail. Proposals that merely offer to provide service in accordance with Section C, *Description/Specifications/ Work Statement*, will be considered technically unacceptable and will not be considered further.

The Offerors must submit a definitive proposal to achieve the end results that are set forth in the Government's requirements. The technical proposal shall be prepared to specifically address the Mission Requirements sub factors.

The Mission Requirements sub factors are:

1. Performance Plan
2. Financial Capability
3. Implementation Plan
4. Quality Management Plan

L.4.1 Sub factor 1: Performance Plan

Offeror shall submit a Performance Plan sufficient enough to meet the applicable requirements of Section C, *Description/Specifications/Work Statement*, paragraph C.2, *Requirement*.

The Performance Plan shall describe in detail the following:

1. The technical specifications of the PV array including optimal size proposed for Nellis Air Force Base, output profile, type of PV cells, efficiency, degradation with environmental factors and age, mounting, tracking method, and all other factors required to evaluate the performance of the proposed PV array
2. Detailed plan to safely invert, transform, and distribute the DC power from the arrays to the 12.47 kV three-phase AC electrical distribution system including interconnection to the Nellis substation.
3. PV array layout on provided land
4. Physical and electrical protection of the PV array and output power

L.4.2 Sub factor 2: Financial Capability

Offeror shall submit documentation of financial capabilities. Financial capability shall demonstrate that the Offeror is in sound financial condition and has the ability to secure the necessary financing to meet the financial and capital requirements of the utility system both now and in the future. If the offeror is securing financing from an outside source provide an official letter from the financier confirming the financial arrangement.

L.4.3 Sub factor 3: Implementation Plan

The Offeror shall submit an Implementation Plan and sufficient supporting information to meet the requirements of Section C, *Description/Specifications/Work Statement*, paragraph C.2, *Requirement*. The implementation plan shall discuss the scheduling and phasing of the project to include procurement of materials, construction, installation of meters required for utility billing, turnover of meter readings and billing responsibilities. The government desires to begin receiving renewable energy (solar power) as soon as possible and expects to receive partial power as construction progresses. The plan shall address timing and acceptance of PV array partial loads as well as disposition of excess power delivered from the PV array. Provide a letter from suppliers and/or manufacturers substantiating the availability of PV cells to meet the proposed implementation plan.

L.4.4 Sub factor 4: Quality Management Plan

The Offeror shall submit a comprehensive Quality Management Plan (QMP) IAW Provision M.3, *Evaluation Factors and Sub factors* and sufficient supporting information to meet the requirements of Section C,

Description/Specifications/Work Statement, paragraph C.2, Requirement. The QMP shall identify the performance standards and/or specifications that the Contractor will comply with for construction, operation, maintenance, management, environmental, disaster recovery, and safety. At a minimum the QMP shall address all applicable federal, state, interstate, and local laws/regulations, the most current version of any base-specific requirements and best engineering and management practices.

The QMP shall also define, in detail, the Contractor's operations and maintenance policies and procedures that implement all defined standards. The QMP shall ensure contract requirements are met and that the system is being operated and maintained in a manner consistent with its long-term ability to provide safe reliable, cost-effective, and compliant service.

L.5 Proposal Preparation Instructions – Volume II: Past Performance

The Offeror shall submit to the Contracting Officer its past performance information and shall provide information about their past performance on photovoltaic (solar power) projects of similar complexity, and the offeror's approach to accomplishing work required in the RFP.

Offerors shall provide references for up to 6 of its largest projects of similar scope. Projects cited and references should be recent (within 5 years of the date of the proposal). The references should be limited to a brief description of the project along with the name of client contact and phone number. If the Offeror fails to provide valid client contacts, past performance references may not be considered. The Government may contact the offeror's references to determine customer satisfaction with various aspects of the offeror's performance.

The Offeror shall provide references for any proposed subcontractors that will be performing a significant portion of the work and for each firm participating in a joint venture or teaming arrangement.

L.6 Proposal Preparation Instructions – Volume III - Contract Documentation

L.6.1 Contract/Representations and Certifications

The purpose of this volume is to provide information to the Government for preparing the contract document and supporting file. The Offeror's proposal shall include a signed copy of the contract. This includes the following:

- Completion of blocks 12-16 and signature and date for blocks 17 and 18 of the Standard Form (SF) 33. Signature by the Offeror on the SF 33 constitutes an offer that the Government may accept. The *original* copy should be clearly marked under separate cover and should be provided without any punched holes.
- Completed pricing information for Section B.
- Section K. Completion of representations, certifications, acknowledgments, and statements.

L.6.2 Exceptions to Terms and Conditions

The Government will accept alternate proposals. Offeror may submit an alternate proposal based on reduced cost to the Government, length of contract, and size of PV array. We will consider proposals that do not exceed our contracting authority under 10 USC 2394a. The alternate proposal shall be clearly marked as an alternate proposal and identify the cost advantages to the Government. Exceptions taken to terms and conditions of the RFP shall be clearly identified. Each exception shall be specifically related to each paragraph and/or specific part of the RFP to which the exception is taken. Provide rationale in support of the exception and fully explain its impact, if any, on the performance, schedule, cost, and specific requirements of the RFP.

This information shall be provided in the format and content of the table below. Unless included in this volume, no exceptions to terms and conditions will be assumed.

RFP EXCEPTIONS

RFP	Paragraph/	Requirement/
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Document	Page	Portion	Rationale
SOW, RFP Contract, etc.	Applicable page and paragraph numbers	Identify the requirement or portion to which exception is taken	Justify why the requirement will not be met or discuss reasons why not meeting the Government's terms and conditions might be advantageous to the Government

L.6.3 Other Required Information

L.6.3.1 Authorized Offeror Personnel

Provide the name, title, and telephone number of the company/division point of contact regarding source-selection decisions made with respect to your proposal and who can obligate your company contractually. Also, identify those individuals authorized to negotiate with the Government.

L.6.3.2 Company/Division Street Address

Provide company/division's street address, county and facility code, size of business (large or small), and labor surplus area designation.

L.6.3.3 Subcontracting Plan (Large Businesses Only)

Each large business Offeror shall submit a Subcontracting Plan as part of their proposal submission. The plan shall be prepared IAW FAR 52-219-9.

L.7 Proposal Preparation Instructions – Volume IV: Price Proposal

L.7.1 Submission of Certified Cost or Pricing Data

It is anticipated that pricing will be based on adequate price competition. Therefore, Offerors are not required to submit certified cost or pricing data. However, if after receipt of proposals it is determined that adequate price competition does not exist, cost or pricing data (see FAR 15.406-2, *Certificate of Current Cost or Pricing Data*) shall be required.

If it is determined that adequate price competition does not exist, the Offeror shall provide current, complete, and accurate cost or pricing data within 30 calendar days after receipt of the Contracting Officer's request.

L.7.2 General

The solicitation and any resulting contract will be an indefinite term, commencing with the date of award, unless the Government terminates said contract. If the Government terminates the contract, whether for convenience or default, the appropriate FAR termination clause will apply.

The Offeror must submit a schedule B-1 with their proposal.

These instructions are to assist you in submitting information other than cost or pricing data that is required to evaluate the reasonableness, realism, and completeness of your proposed Price. Compliance with these instructions is mandatory and failure to comply may result in rejection of your proposal. Offers should be sufficiently detailed to demonstrate their cost credibility. The burden of proof for cost credibility rests with the Offeror.

L.7.3 Estimating Techniques and Methods

When responding to the Price Volume requirements in the RFP, the Offeror and its associated subcontractors may use any generally accepted estimating techniques, including contemporary estimating methods.

L.7.4 Accounting Systems

The Contractor shall describe the proposed accounting system for this contract. The accounting system shall be in compliance with paragraph G.4, *Accounting Procedures*.

L.7.5 Organization

Volume IV shall consist of the following sections:

- Table of Contents
- Section 1: Schedule B-1
- Section 2: Cost Proposal, Introduction, and Pricing Assumptions
- Section 3: General Estimating Methodology

L.7.6 Detailed Instructions for Price Proposal

Table of Contents

The Price volume shall be prefaced by a Table of Contents and shall specify, by page number, the location of information requested in these instructions.

L.7.6.1 Schedule B-2 Instructions

Include a completed copy of the RFP Schedule B-1, Utility Service Payment by the Government. The projected cash flow will be calculated and compared to the Government's present value estimate for the term of the land use agreement. Present values will be calculated at the discount rate specified in Appendix C of OMB Circular A-94 that is current at the time proposals requested herein are due.

The monthly rate will be extended by 12 months to reach the annual cost. The annual cost will be escalated at the nominal rate indicated in Schedule B-1 and included in each year of the cash-flow projection.

L.7.6.2 Cost Proposal, Introduction, and Pricing Assumptions

Discuss the pricing methodology used to develop offered price and escalation rate. The discussion of pricing methodology must explicitly show the offeror's calculation of cost/KWh.

The Offeror shall provide the breakdown of their proposed Fixed Monthly kWh charge and nominal escalation rate proposed in Schedule B-1. In particular the Offeror shall provide documentation on how the kWh rate base is developed including tax credits, other incentives, sale of RECs, operation and maintenance, as well as the fixed nominal escalation rate. The offeror shall identify the total U.S. Federal Taxes included in the Total Fixed Monthly Charge.

The offeror shall provide documentation on the proposed sale of the RECs; indicating who will purchase the RECs; the price per REC; any approvals required including estimated approval time; and any contingencies that may affect the proposal. All contingencies will be considered exceptions and shall be in conformance with Section L.6.2, Exceptions to Terms and Conditions.

Operations and Maintenance

Operations and maintenance costs are those costs associated with the day-to-day operation of the utility system and scheduled preventative and predictive maintenance. Typical cost categories might include, but are not limited to, all labor (direct and indirect), materials and procurement costs, insurance, equipment, general and administrative, and overhead costs. This cost shall be incorporated into the KWh rate.

L.7.6.3 General Estimating Methodology

Summarize your standard estimating system or method as it pertains to this acquisition.

The Government is asking for *prime contractor* fully loaded rates (subcontracts have been removed). However, in the event that the Offeror has an official teaming arrangement or interdivisional effort, the proposed rates shall reflect that. State whether or not your Disclosure Statement has been determined adequate by the cognizant

Government ACO. If determined adequate, provide date of approval. Identify any outstanding Cost Accounting Standards (CAS) violations; provide status/action being taken. If exempted from submitting a CAS Disclosure Statement so state, and identify the reason for the exemption.

ATTACHMENT 1: PAST PERFORMANCE INFORMATION

Provide the information requested in this form for each program being described. Provide frank, concise comments regarding your performance on the contracts you identify.

A. OFFEROR NAME (COMPANY/DIVISION) AND LOCATION (CITY/STATE):

(NOTE: IF THE COMPANY OR DIVISION PERFORMING THIS EFFORT IS DIFFERENT THAN THE OFFEROR, OR THE RELEVANCE OF THIS EFFORT TO THE ACQUISITION IS IMPACTED BY ANY COMPANY/CORPORATE ORGANIZATIONAL CHANGE, NOTE THOSE DIFFERENCES/CHANGES AND EXPLAIN WHY THE PAST PERFORMANCE SHOULD BE ATTRIBUTED TO THE OFFEROR. REFER TO THE "ORGANIZATIONAL STRUCTURE CHANGE HISTORY" YOU PROVIDED AS PART OF YOUR RELEVANT PRESENT AND PAST PERFORMANCE VOLUME.)

B. PROJECT TITLE:

C. CONTRACT SPECIFICS:

1. Contract Number _____
2. Contract Type _____
3. Period of Performance _____
4. Original Contract \$ Value _____
5. Current Contract \$ Value _____

If Amounts for 4 and 5 above are different, provide a brief description of the reasons for the difference

D. BRIEF DESCRIPTION OF EFFORT AS __PRIME OR __SUBCONTRACTOR.

(Please highlight portions considered most relevant to current acquisition)

E. COMPLETION DATE:

1. Original Contractual Date: _____
2. Current Schedule: _____
3. Estimated Date of Completion: _____
4. How Many Times Changed: _____
5. Primary Causes of Change: _____

F. PRIMARY GOVERNMENT OR EQUIVALENT POINTS OF CONTACT:

(Please provide current information on all individuals)

1. Project Manager: Name: _____
 Office _____
 Address _____

	Telephone	_____
	E-mail	_____
	Fax	_____
2. PCO:	Name:	_____
(Procuring Contracting Officer)	Office	_____
	Address	_____

	Telephone	_____
	E-mail	_____
	Fax	_____
3. ACO:	Name:	_____
(Administered Contract Officer)	Office	_____
	Address	_____

	Telephone	_____
	E-mail	_____
	Fax	_____
4. COR:	Name:	_____
(Contracting Officer Rep)	Office	_____
	Address	_____

	Telephone	_____
	E-mail	_____
	Fax	_____

G. ADDRESS ANY TECHNICAL (OR OTHER) AREA ABOUT THIS PROJECT CONSIDERED UNIQUE.

H. SPECIFY BY NAME ANY KEY INDIVIDUAL(S) WHO PARTICIPATED IN THIS PROJECT AND IS/ARE PROPOSED TO SUPPORT THE INSTANT ACQUISITION. ALSO, INDICATE THEIR CONTRACTUAL ROLES FOR BOTH ACQUISITIONS.

I. ADDRESS PROBLEMS ENCOUNTERED ON THIS CONTRACT AND YOUR SOLUTIONS TO THOSE PROBLEMS.

J. IDENTIFY IF A SMALL BUSINESS OR DISADVANTAGED BUSINESS PLAN OR GOAL WAS REQUIRED. IF SO, IDENTIFY IN TERMS OF A PERCENTAGE OF THE PLANNED VERSUS ACHIEVED GOAL DURING THE CONTRACT. IF GOALS WERE NOT MET, PLEASE EXPLAIN.

K. DESCRIBE/DISCUSS THE RELEVANCY OF THE SERVICES YOU PROVIDED ON YOUR REFERENCED CONTRACT TO THESE QUESTIONS AS THEY MAY PERTAIN TO THE SPECIFIC UTILITY.

General

1. Indicate (yes or no) if you owned, operated, maintained the system for the referenced customer. Indicate if the systems were located on the customer's site.

	OWN	OPERATE	MAINTAIN	ON SITE
Photovoltaic Array				

(End of Summary of Changes)

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LIST OF REFERENCES

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